

## **Appendix C**

### **Well Construction Diagrams**

#### **Northwest Boundary Area RCRA Facility Investigation Fort Buchanan, Puerto Rico**

# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** MW-01

**Elevation:** 33.23

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO

**Start date:** 12/4/2006

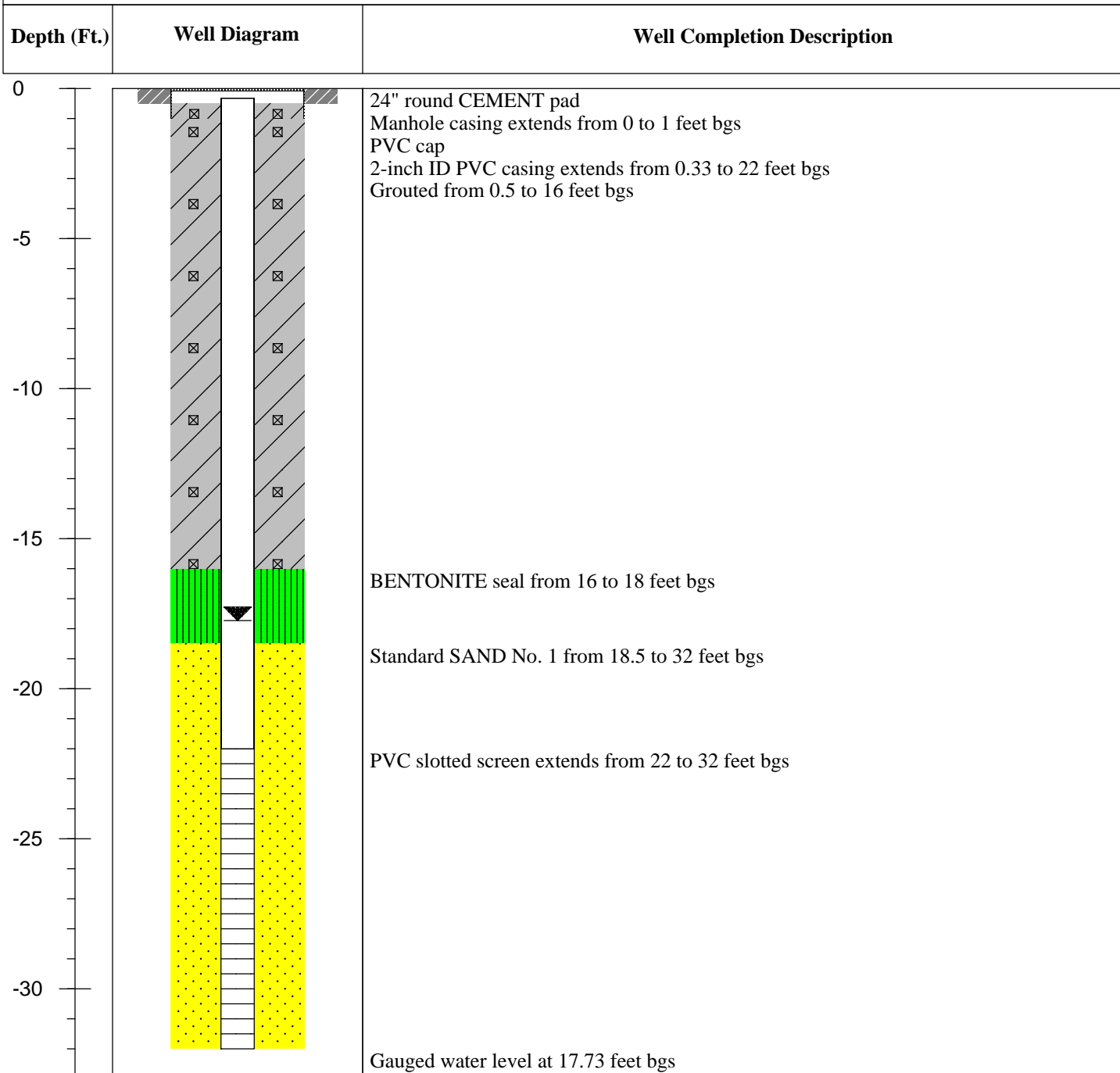
**Survey Datum:** UTM NAD83

**Northing (m):** 867063.26

**Easting (m):** 760469.08

**End Date:** 12/4/2006

**Comment:**



# WELL CONSTRUCTION DIAGRAM

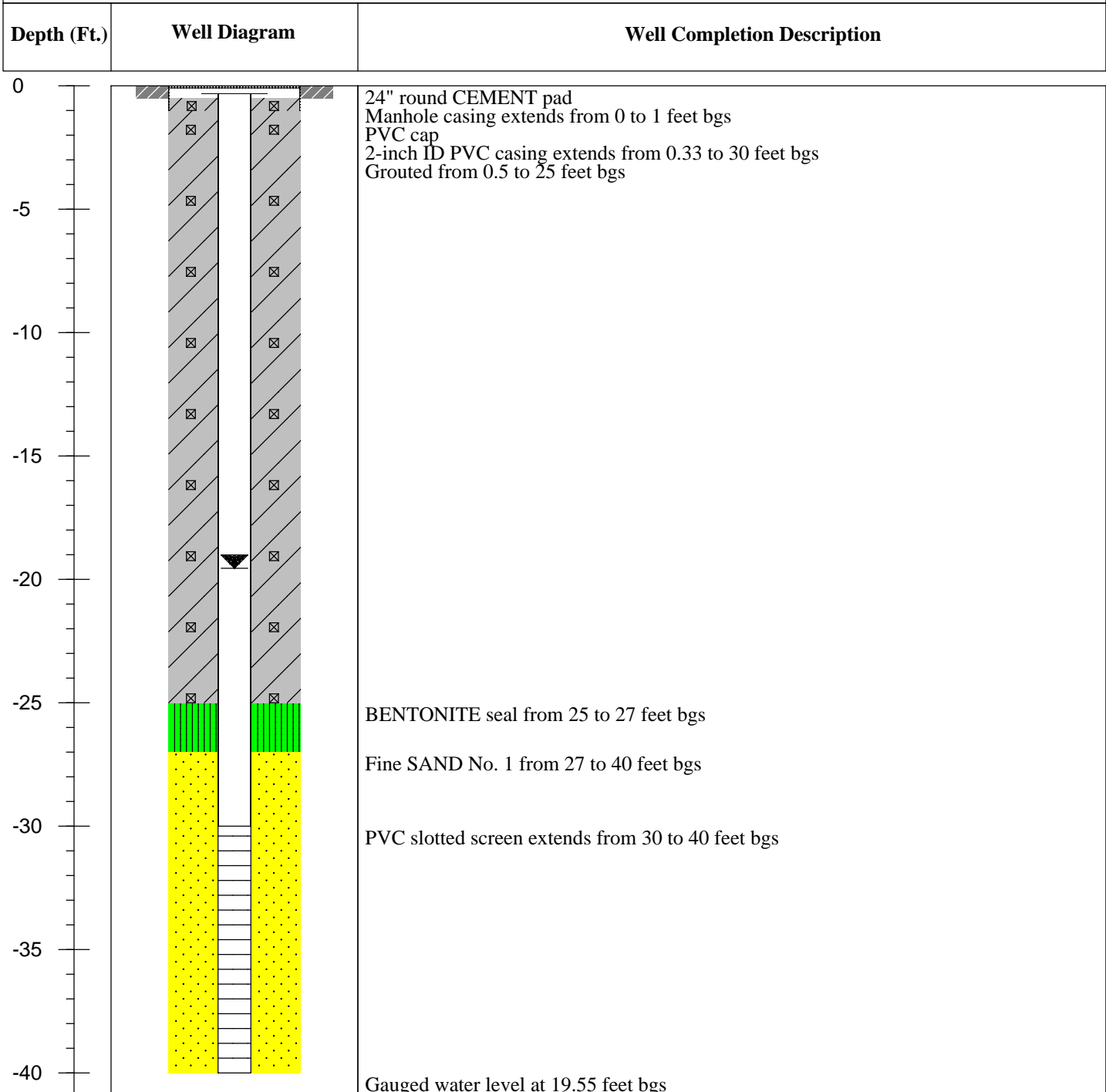


1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-02	<b>Elevation:</b> 61.05	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> EDUARDO SANTIAGO	<b>Start date:</b> 12/6/2006	
<b>Survey Datum:</b> UTM NAD83	<b>Northing (m):</b> 866516.94	<b>Easting (m):</b> 760773.70	<b>End Date:</b> 12/7/2006

**Comment:**



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

# FORT BUCHANAN

**Well ID: MW-03A**

**Elevation:**36.49

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO

**Start date:**10/27/2006

**Survey Datum:** UTM NAD83

**Northing (m):**867224.75

Easting (m):761011.49

**End Date:** 10/27/2006

**Comment:**

Depth (Ft.)	Well Diagram	Well Completion Description
0		24" round CEMENT pad Manhole casing extends from 0 to 1 feet bgs PVC cap 2-inch ID PVC casing extends from 0.33 to 24 feet bgs Grouted from 0.5 to 20 feet bgs
-5		
-10		
-15		
-20		BENTONITE seal from 20 to 22 feet bgs
-25		Standard SAND from 22 to 34 feet bgs
-30		PVC slotted screen extends from 24 to 34 feet bgs
-35		Gauged water level at 26.80 feet bgs

# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** MW-03B

**Elevation:** 36.22

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO

**Start date:** 10/25/2006

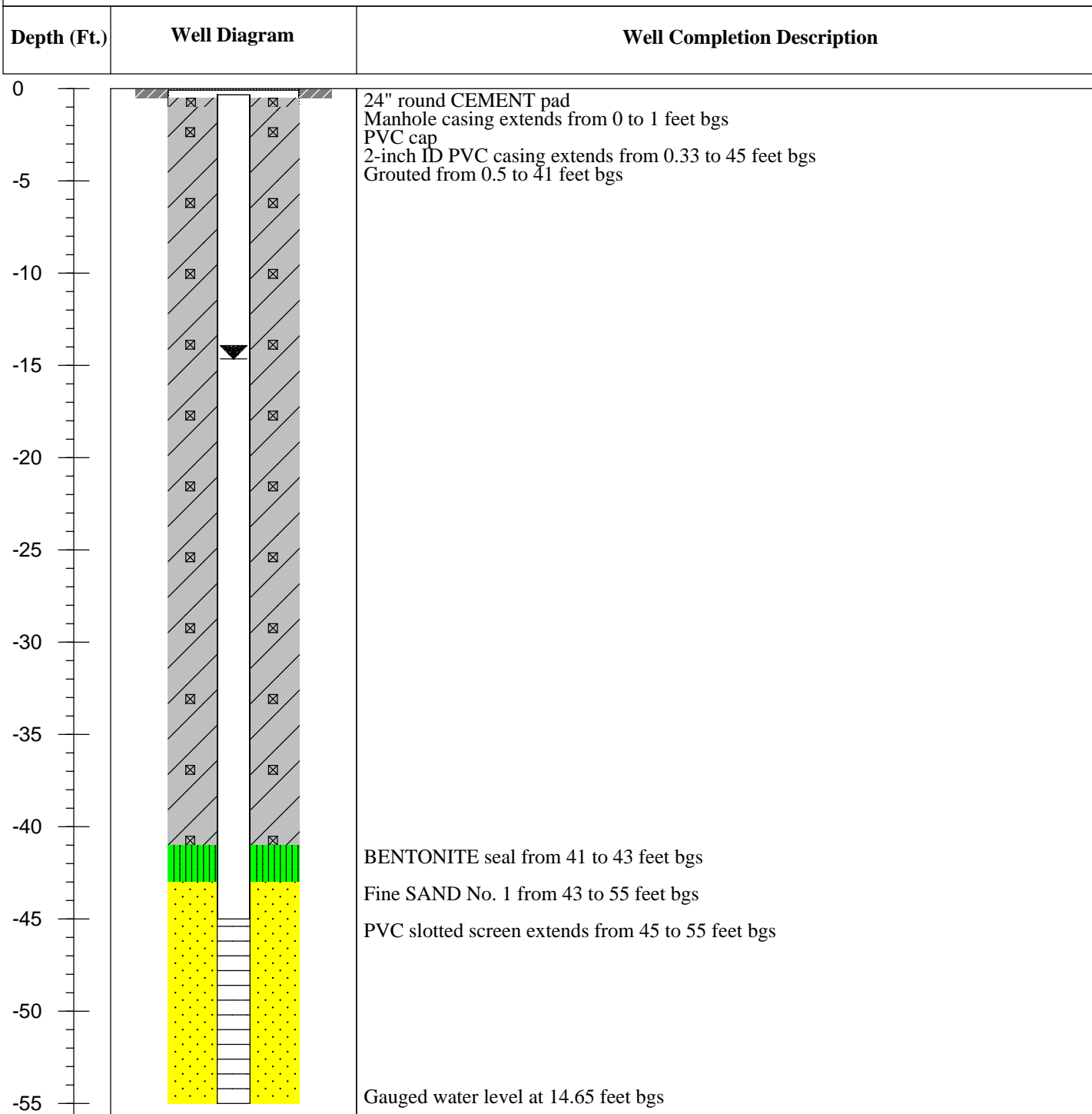
**Survey Datum:** UTM NAD83

**Northing (m):** 867219.90

**Easting (m):** 760997.56

**End Date:** 10/26/2006

**Comment:**



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** MW-04A

**Elevation:** 42.00

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO

**Start date:** 11/30/2006

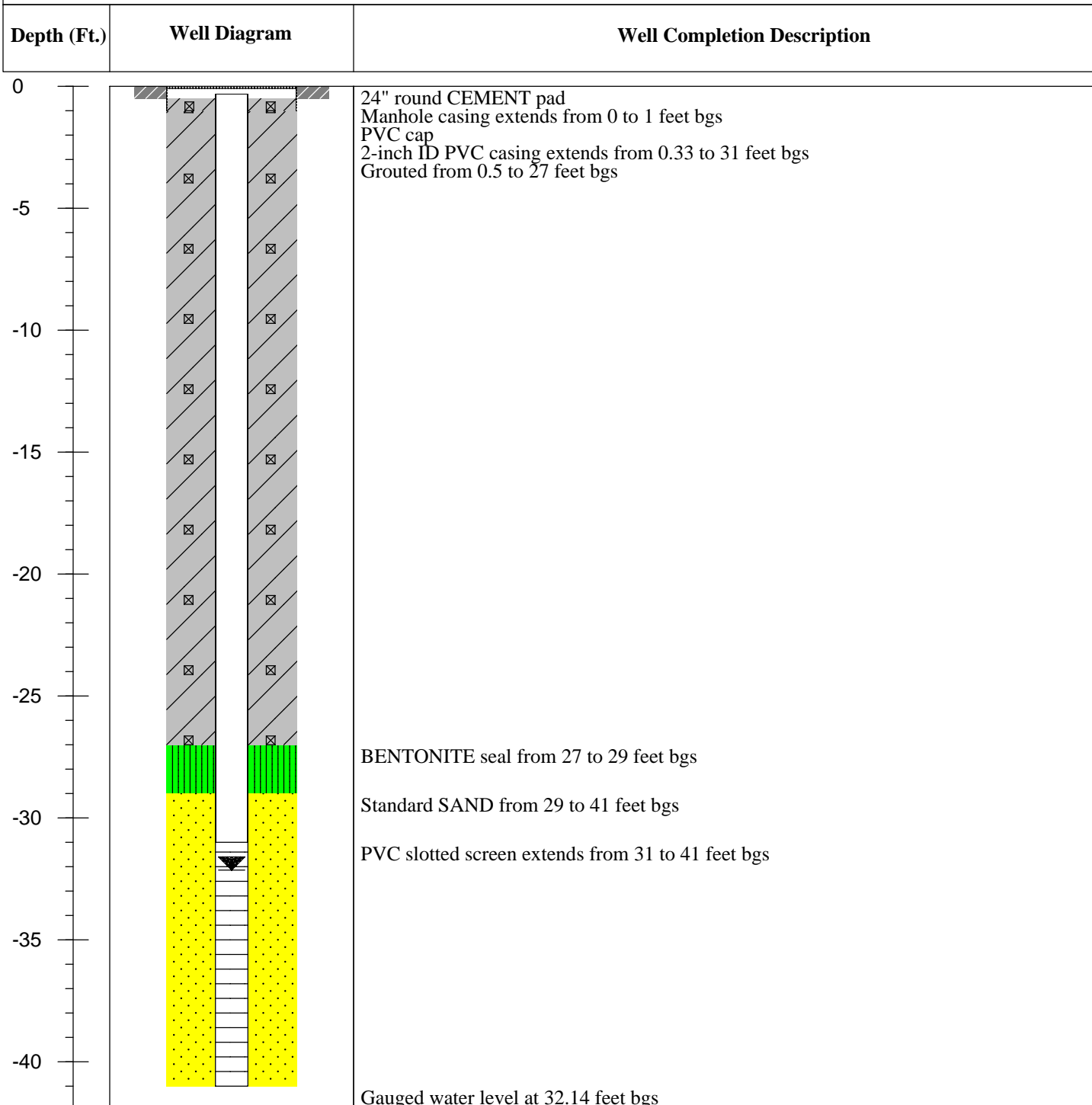
**Survey Datum:** UTM NAD83

**Northing (m):** 867307.44

**Easting (m):** 761301.34

**End Date:** 11/30/2006

**Comment:**



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** MW-04B

**Elevation:** 41.88

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO

**Start date:** 11/30/2006

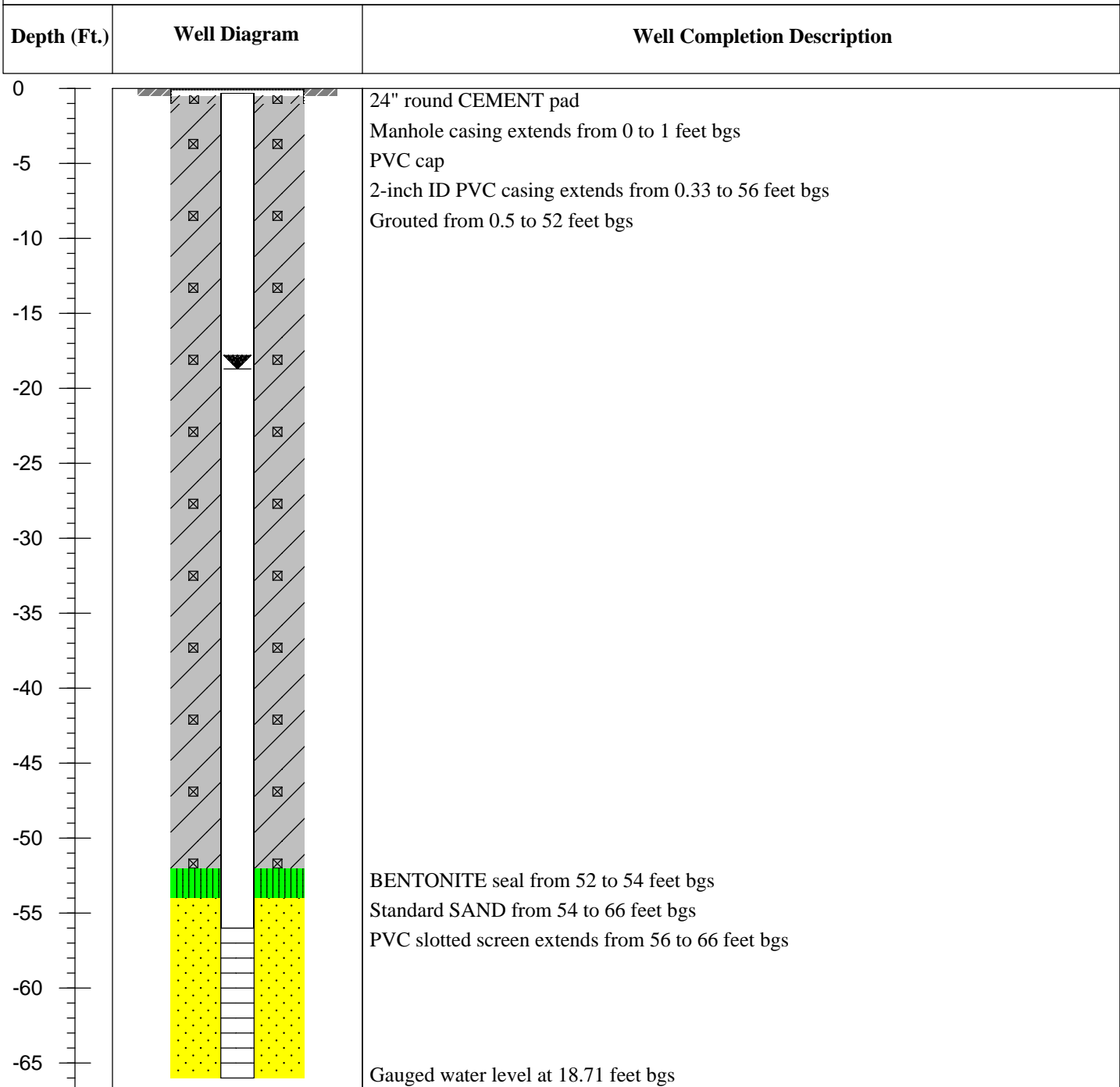
**Survey Datum:** UTM NAD83

**Northing (m):** 867304.94

**Easting (m):** 761290.88

**End Date:** 11/30/2006

**Comment:**



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** MW-05A

**Elevation:** 38.10

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO

**Start date:** 11/10/2006

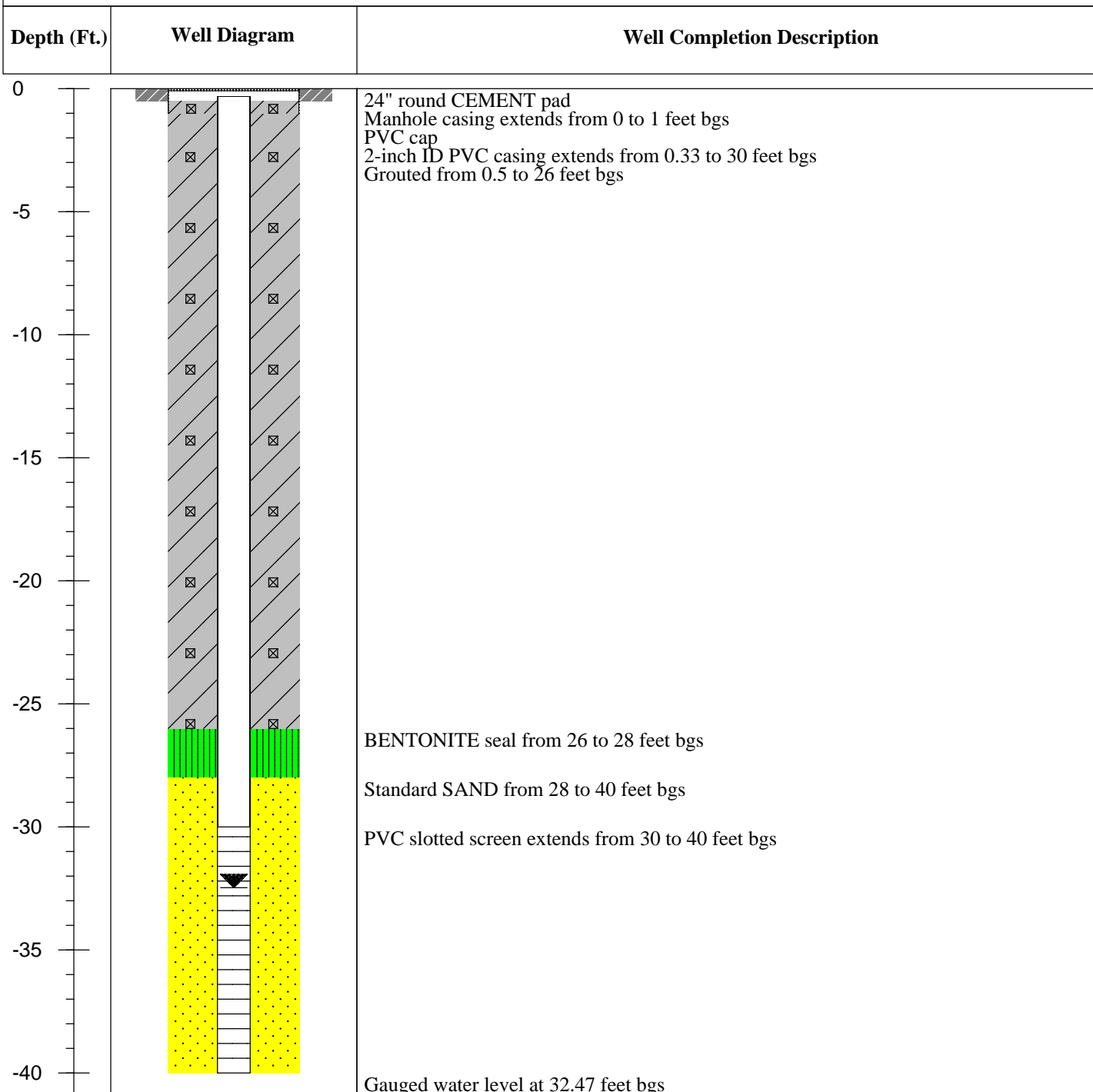
**Survey Datum:** UTM NAD83

**Northing (m):** 867702.22

**Easting (m):** 761461.54

**End Date:** 11/10/2006

**Comment:**





# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** MW-05B

**Elevation:** 37.85

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO

**Start date:** 11/7/2006

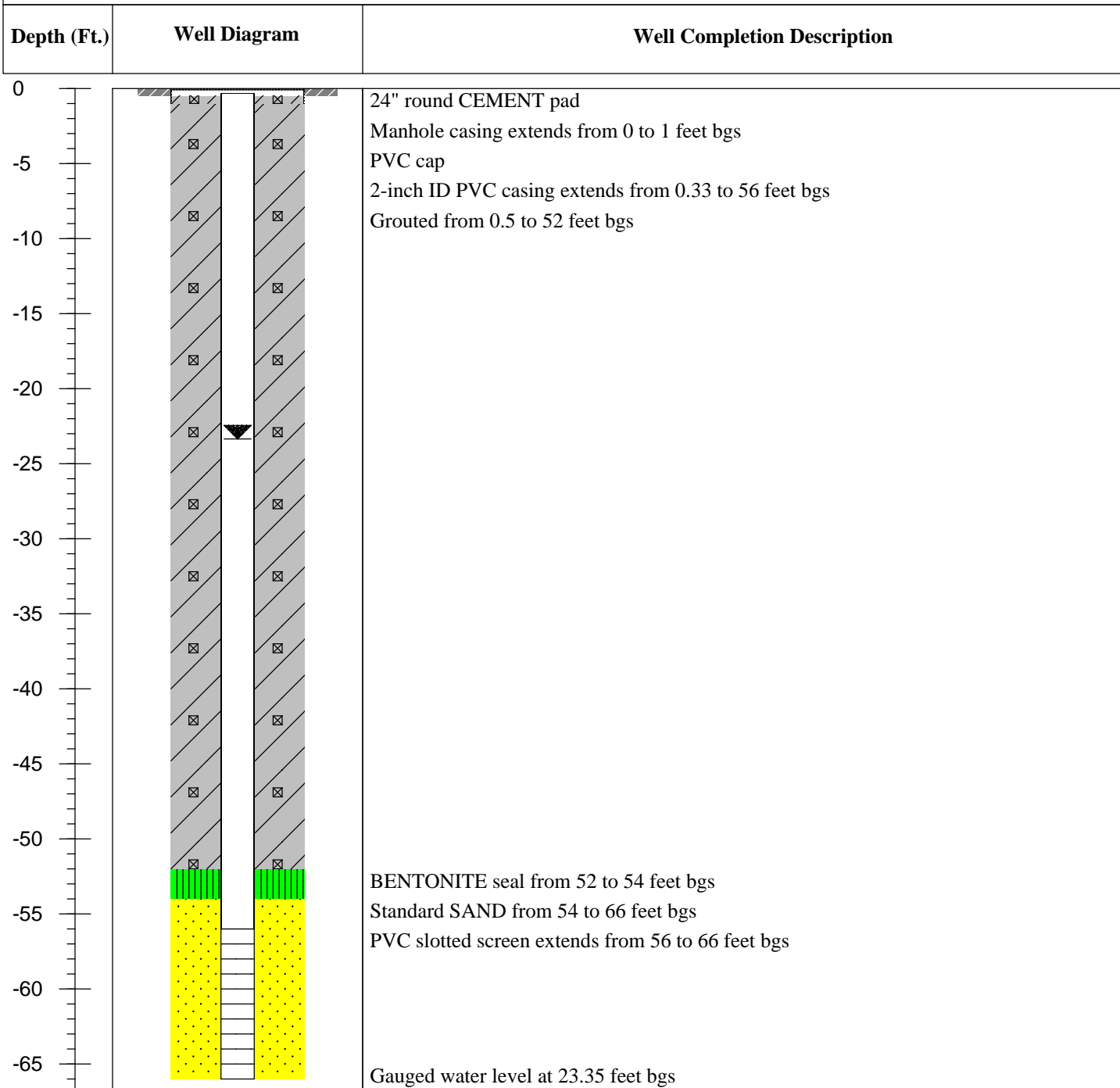
**Survey Datum:** UTM NAD83

**Northing (m):** 867716.60

**Easting (m):** 761458.35

**End Date:** 11/9/2006

**Comment:**



BENTONITE seal from 52 to 54 feet bgs

Standard SAND from 54 to 66 feet bgs

PVC slotted screen extends from 56 to 66 feet bgs

Gauged water level at 23.35 feet bgs

# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** MW-06A

**Elevation:** 13.53

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO

**Start date:** 11/6/2006

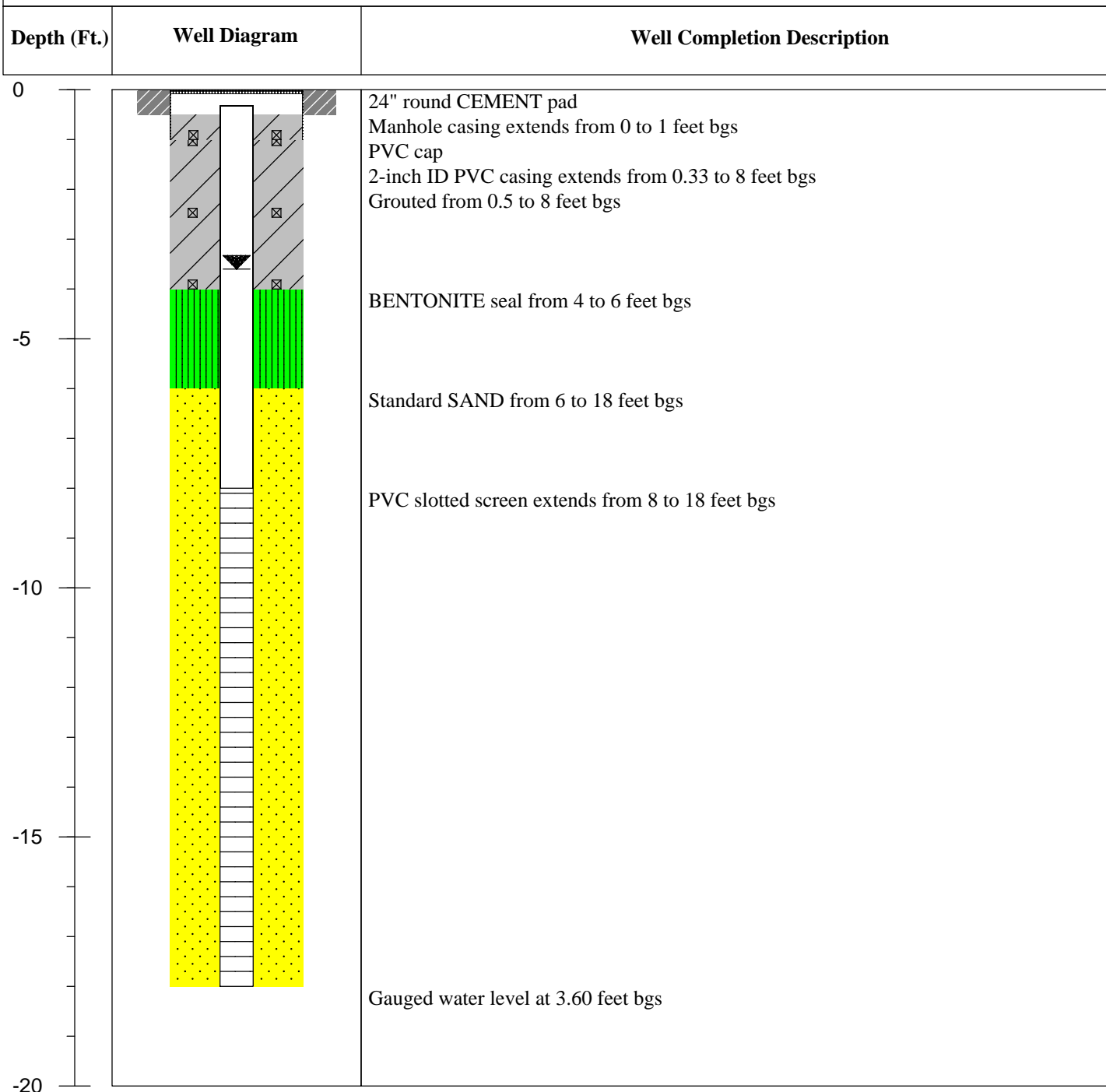
**Survey Datum:** UTM NAD83

**Northing (m):** 868268.25

**Easting (m):** 761468.57

**End Date:** 11/7/2006

**Comment:**



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** MW-06B

**Elevation:** 13.25

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO

**Start date:** 11/2/2006

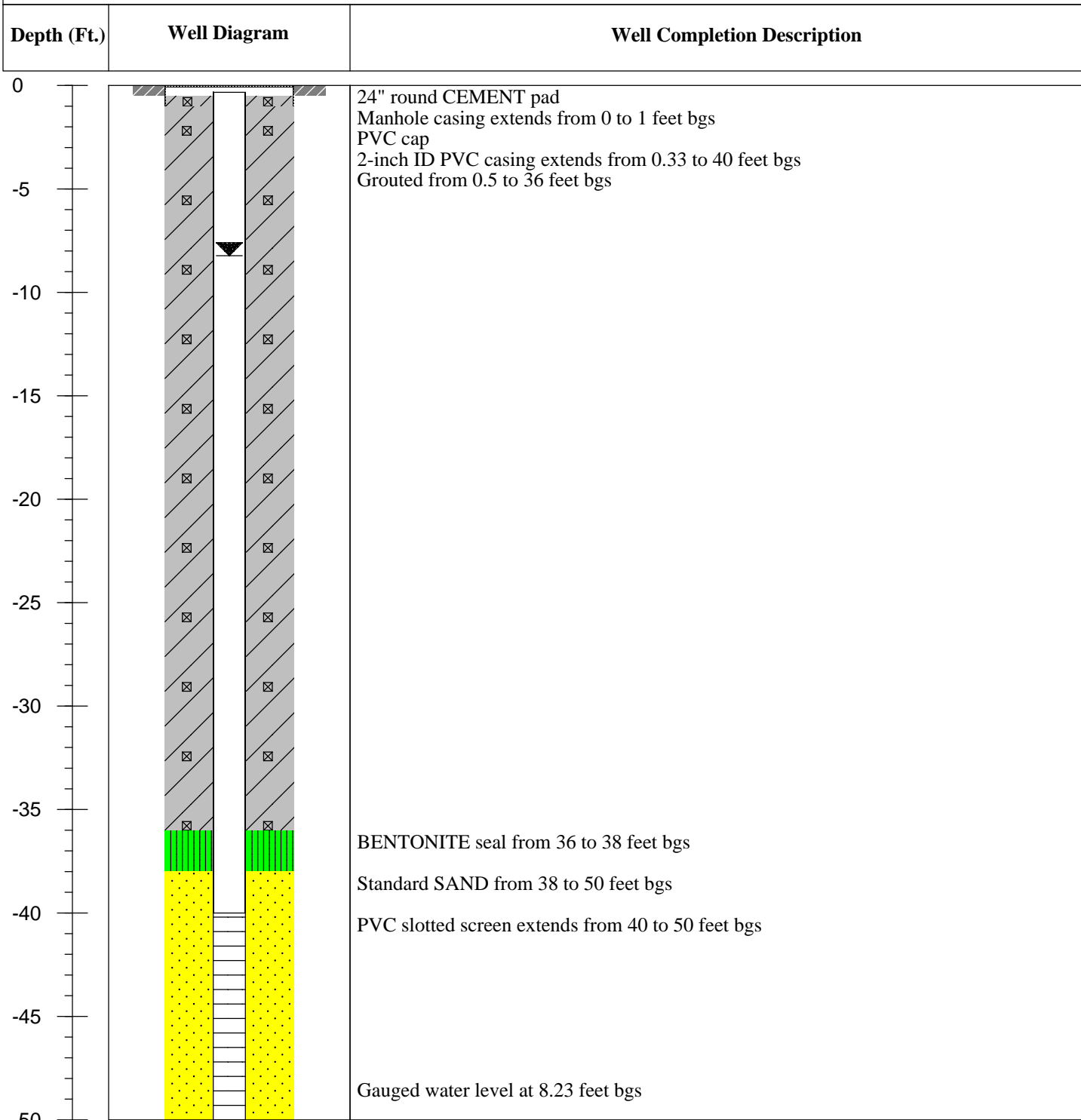
**Survey Datum:** UTM NAD83

**Northing (m):** 868277.70

**Easting (m):** 761473.77

**End Date:** 11/3/2006

**Comment:**



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** MW-07A

**Elevation:** 9.17

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO

**Start date:** 11/1/2006

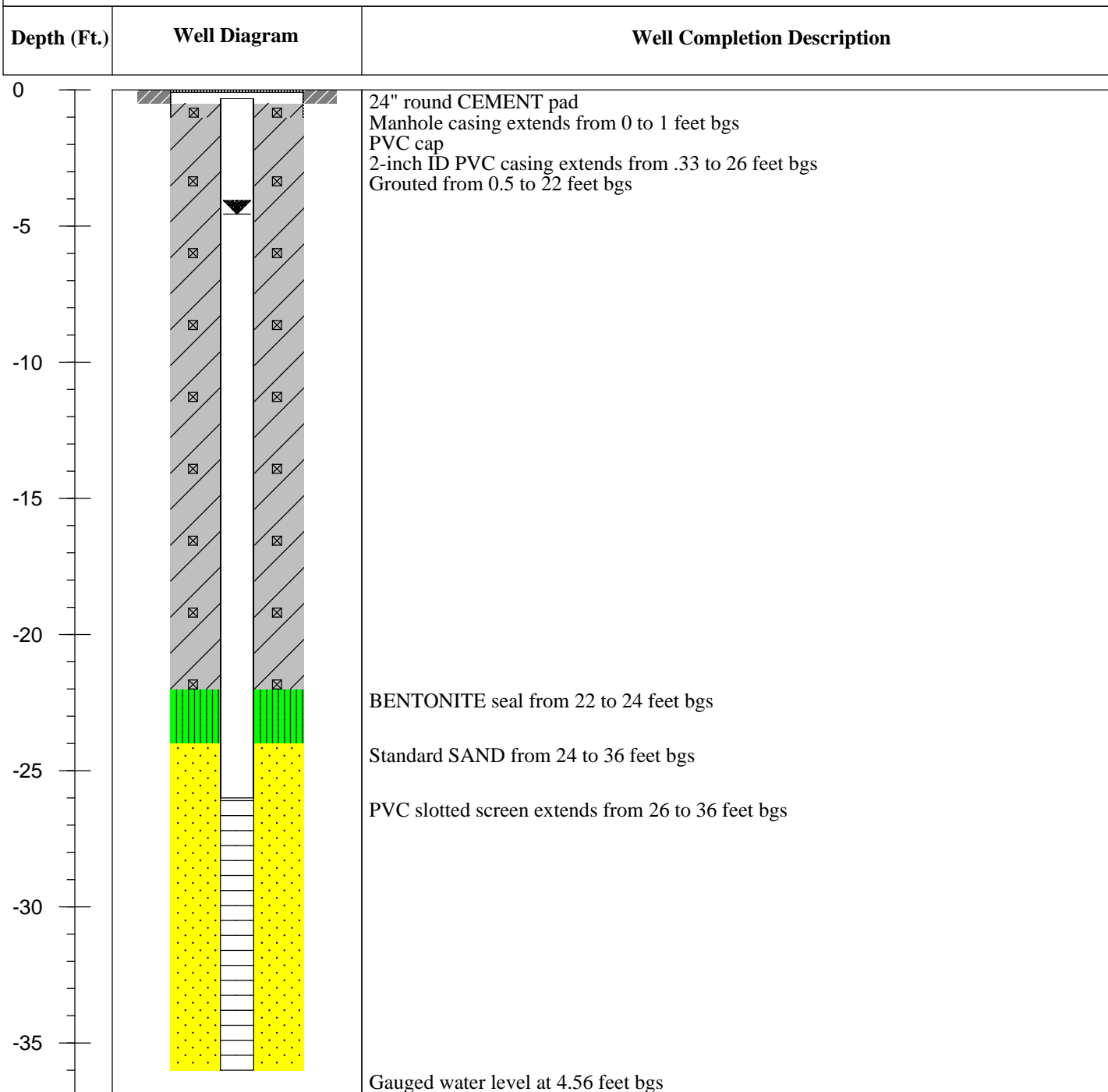
**Survey Datum:** UTM NAD83

**Northing (m):** 868789.89

**Easting (m):** 761817.53

**End Date:** 11/1/2006

**Comment:**



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** MW-07B

**Elevation:** 9.24

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO

**Start date:** 10/30/2006

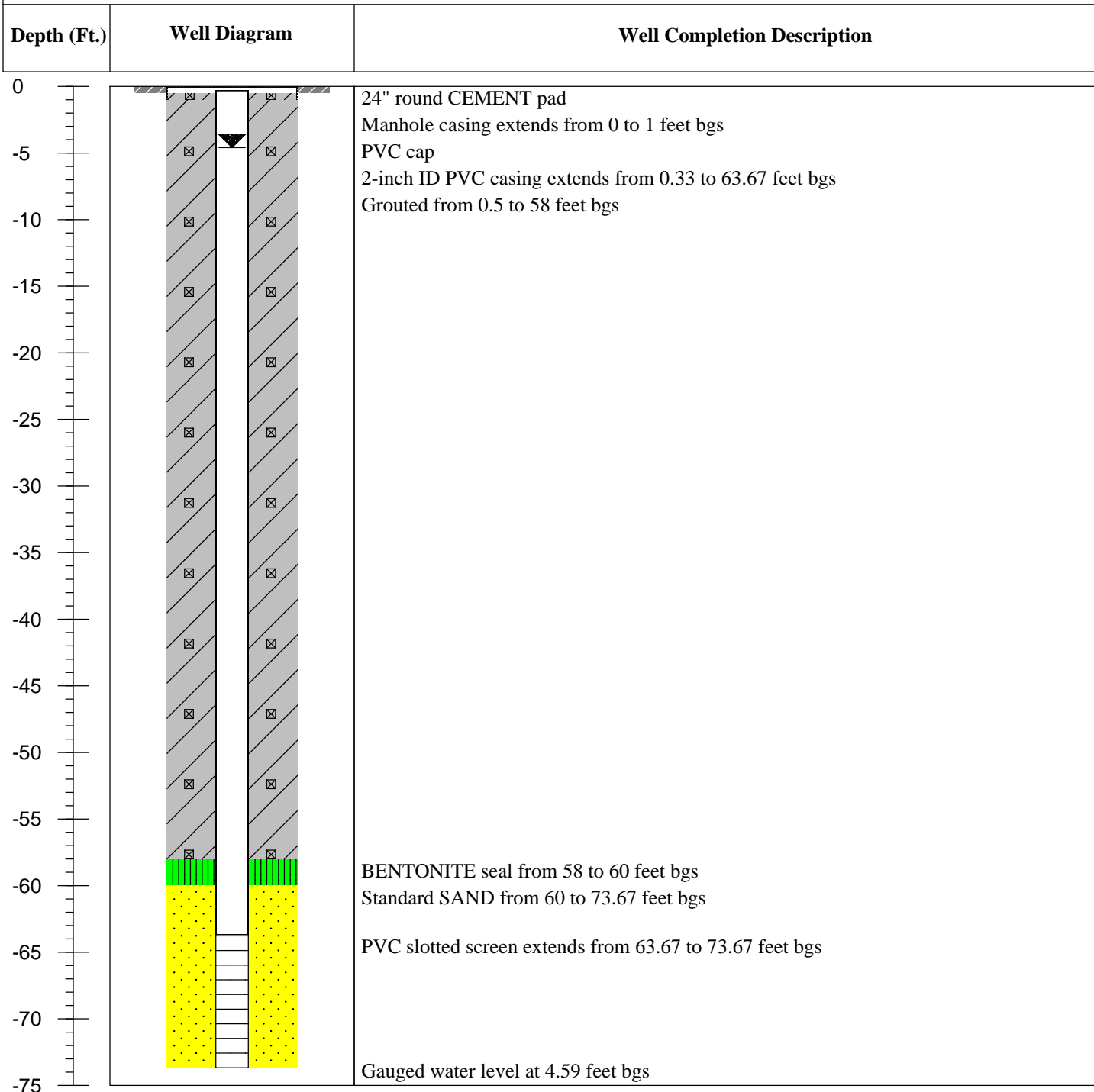
**Survey Datum:** UTM NAD83

**Northing (m):** 868796.37

**Easting (m):** 761825.39

**End Date:** 10/31/2006

**Comment:**



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** MW-08A

**Elevation:** 19.92

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO

**Start date:** 12/7/2006

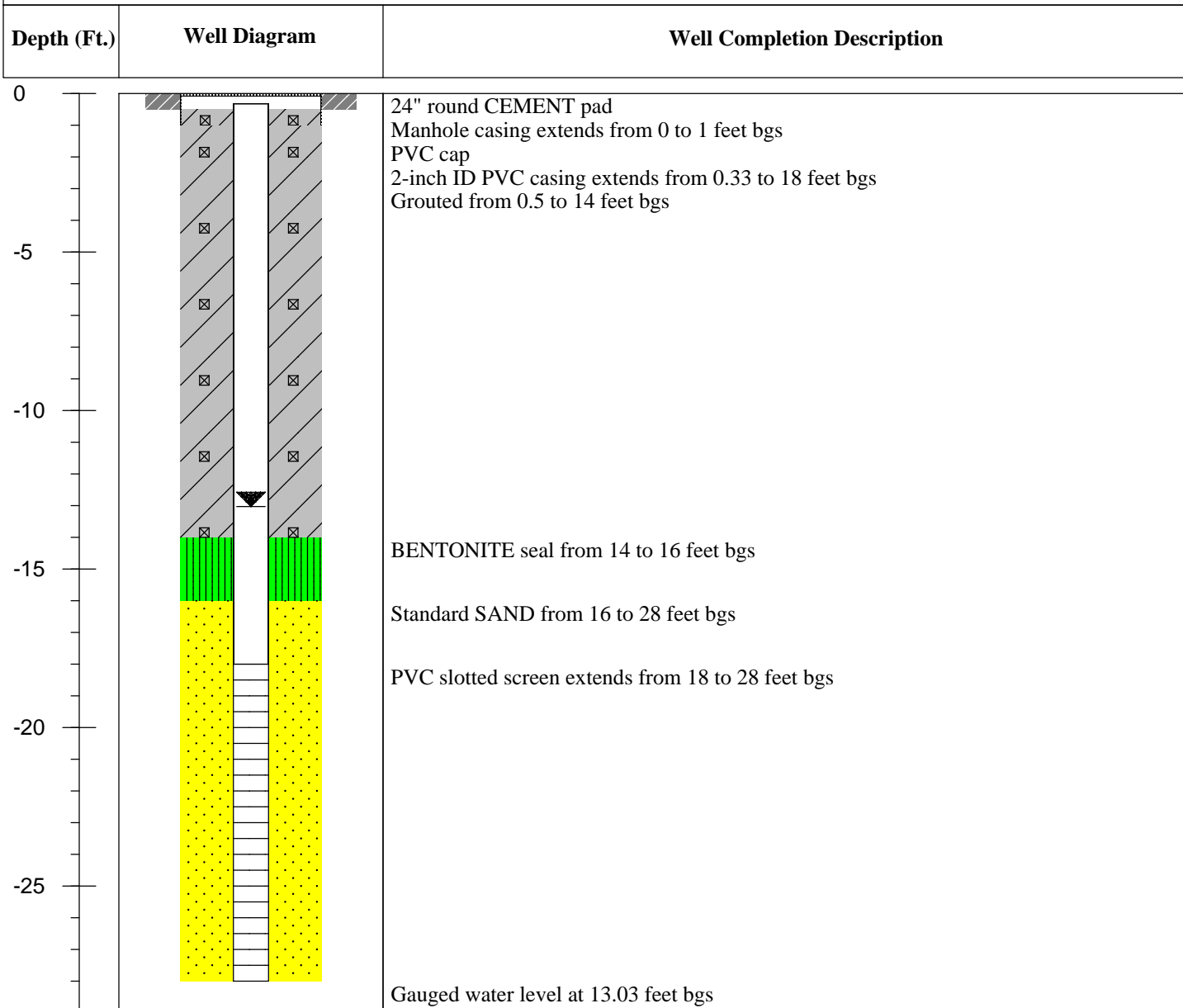
**Survey Datum:** UTM NAD83

**Northing (m):** 868068.71

**Easting (m):** 762036.57

**End Date:** 12/7/2006

**Comment:**



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** MW-08B

**Elevation:** 19.66

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO

**Start date:** 12/4/2006

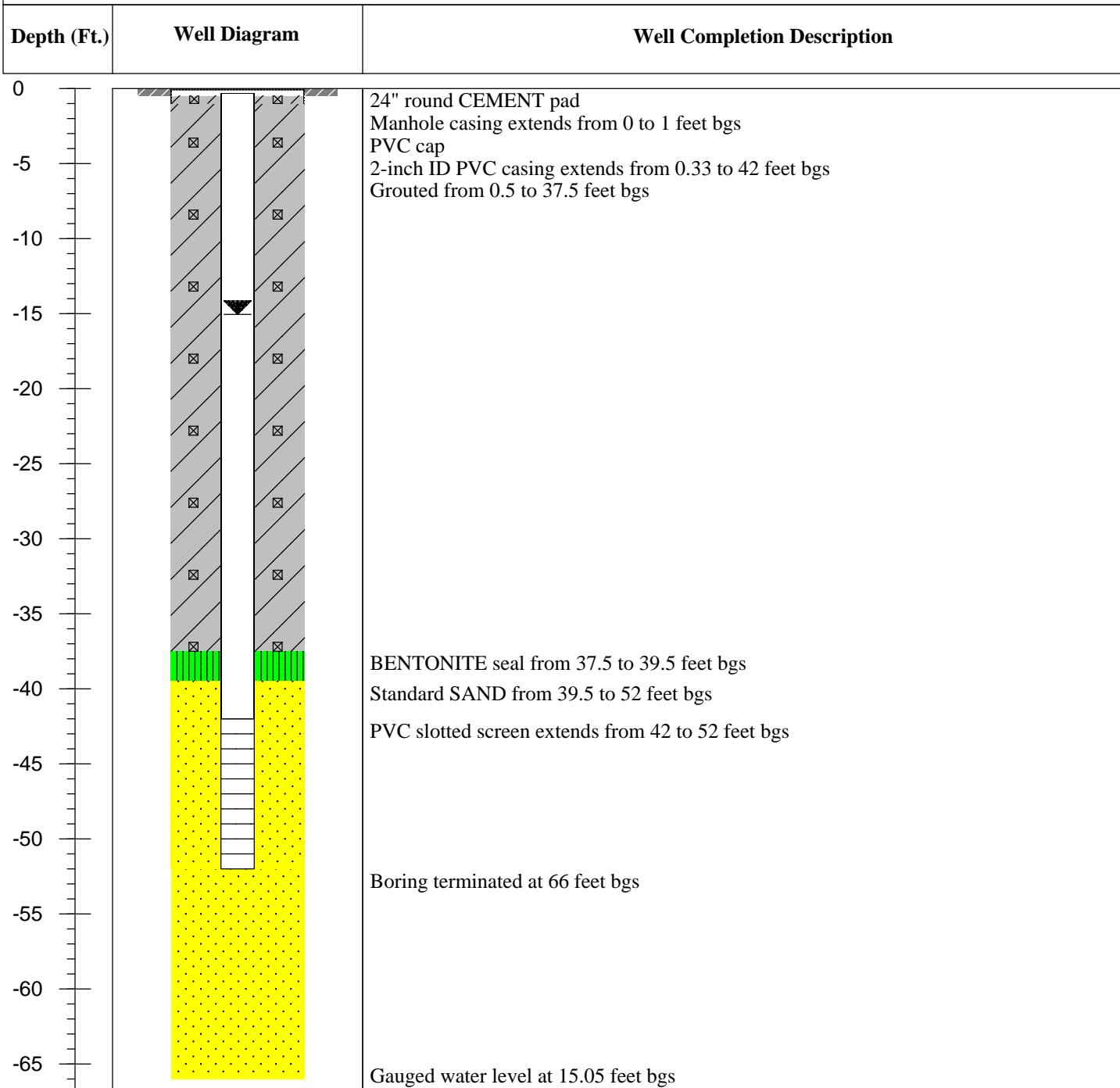
**Survey Datum:** UTM NAD83

**Northing (m):** 868073.87

**Easting (m):** 762044.56

**End Date:** 12/6/2006

**Comment:**



BENTONITE seal from 37.5 to 39.5 feet bgs

Standard SAND from 39.5 to 52 feet bgs

PVC slotted screen extends from 42 to 52 feet bgs

Boring terminated at 66 feet bgs

Gauged water level at 15.05 feet bgs

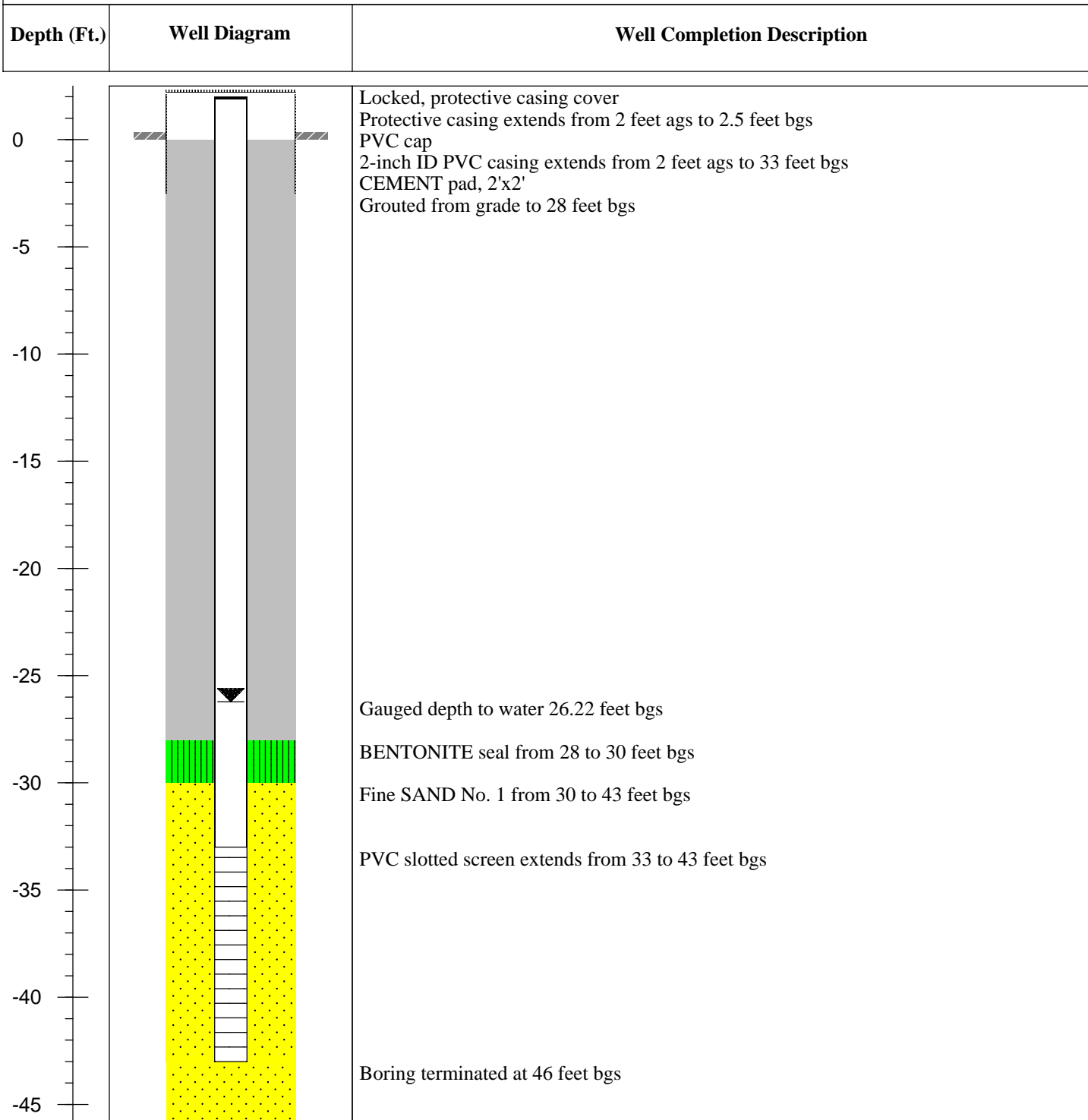
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-09A	<b>Elevation:</b> 39.12	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> EDUARDO SANTIAGO	<b>Start date:</b> 5/10/2007	
<b>Survey Datum:</b> UTM NAD83	<b>Northing (m):</b> 867399.53	<b>Easting (m):</b> 761776.50	<b>End Date:</b> 5/11/2007
<b>Comment:</b> Buchanan, south of DPW yard			





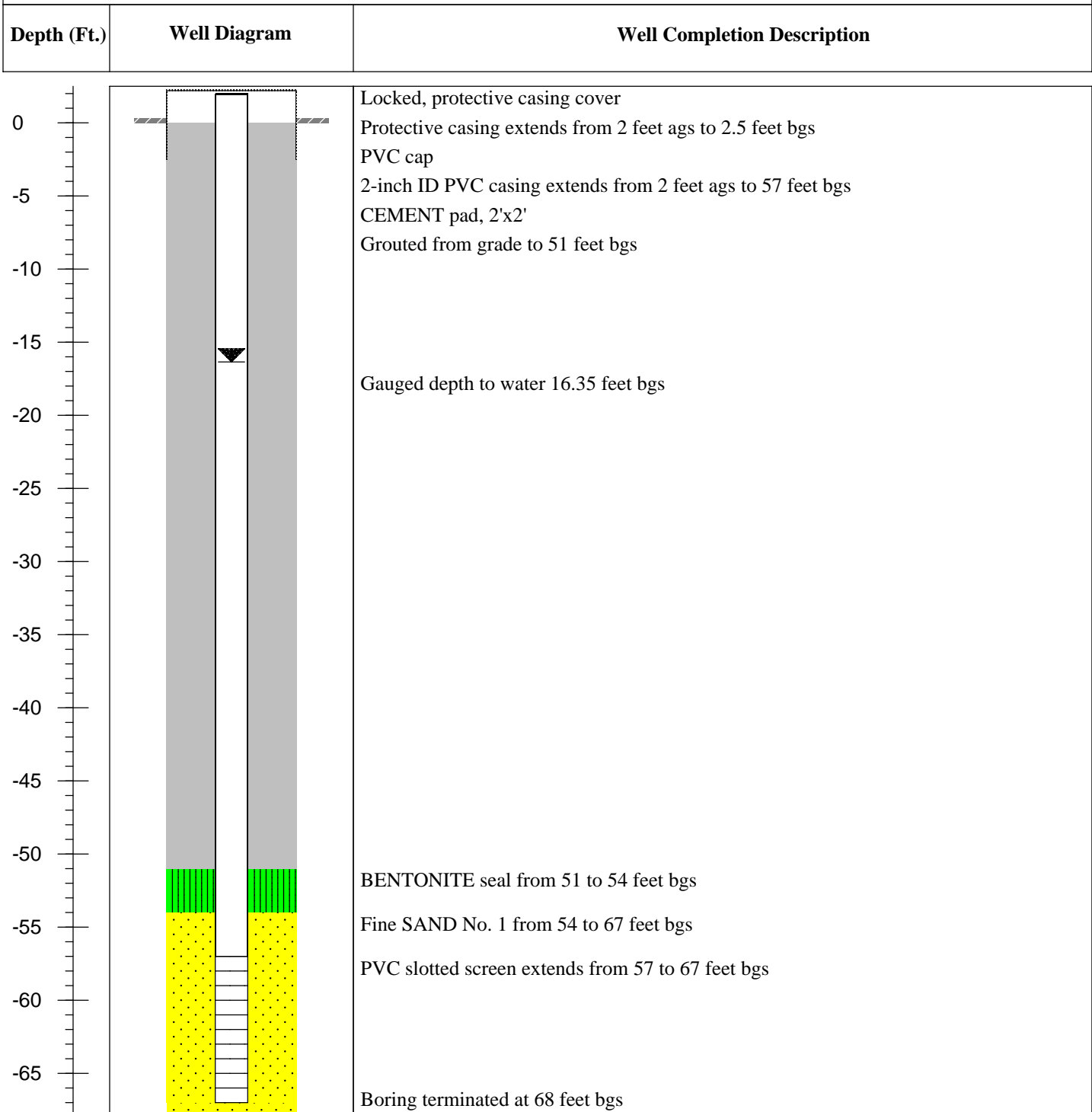
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-09B	<b>Elevation:</b> 38.90	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> EDUARDO SANTIAGO	<b>Start date:</b> 5/8/2007	
<b>Survey Datum:</b> UTM NAD83	<b>Northing (m):</b> 867399.57	<b>Easting (m):</b> 761765.01	<b>End Date:</b> 5/10/2007
<b>Comment:</b> Buchanan, south of DPW complex			



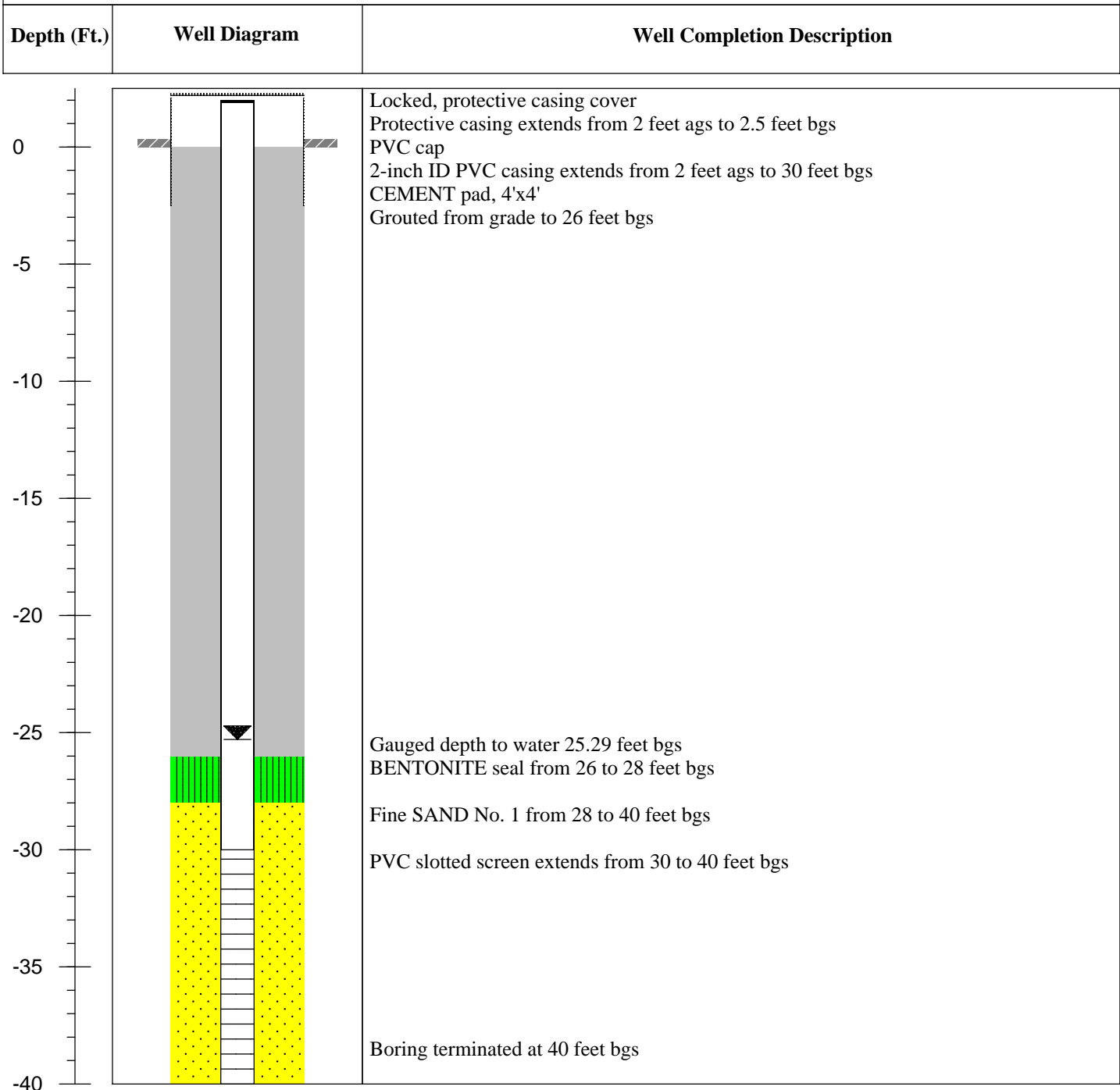
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-10A	<b>Elevation:</b> 29.48	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> EDUARDO SANTIAGO	<b>Start date:</b> 4/26/2007	
<b>Survey Datum:</b> UTM NAD83	<b>Northing (m):</b> 867936.54	<b>Easting (m):</b> 761748.49	<b>End Date:</b> 4/26/2007
<b>Comment:</b> Buchanan, on north side of DPW complex			



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** MW-10B

**Elevation:** 29.32

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO

**Start date:** 4/24/2007

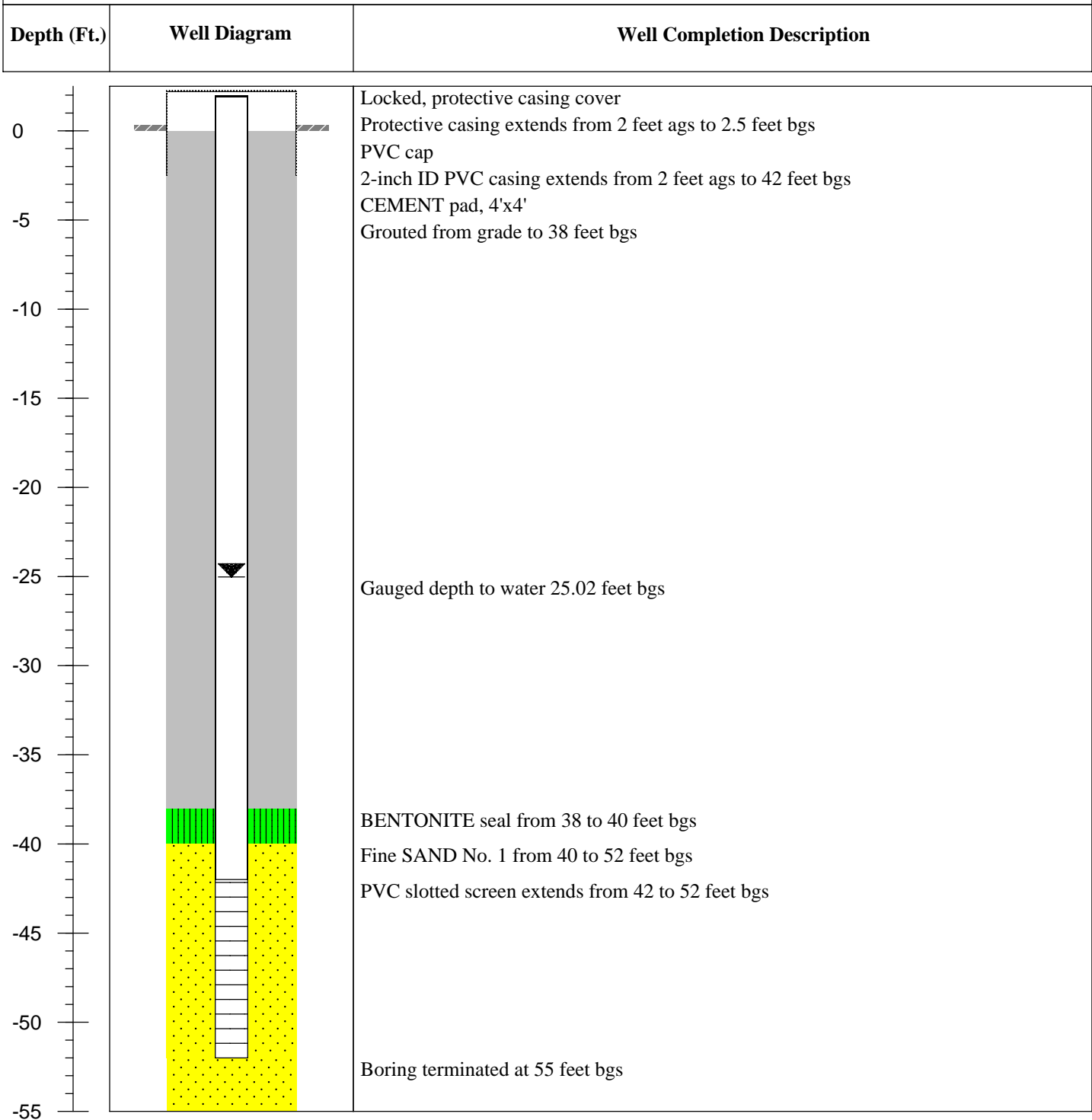
**Survey Datum:** UTM NAD83

**Northing (m):** 867937.12

**Easting (m):** 761760.62

**End Date:** 4/25/2007

**Comment:** Buchanan, on north side of DPW complex



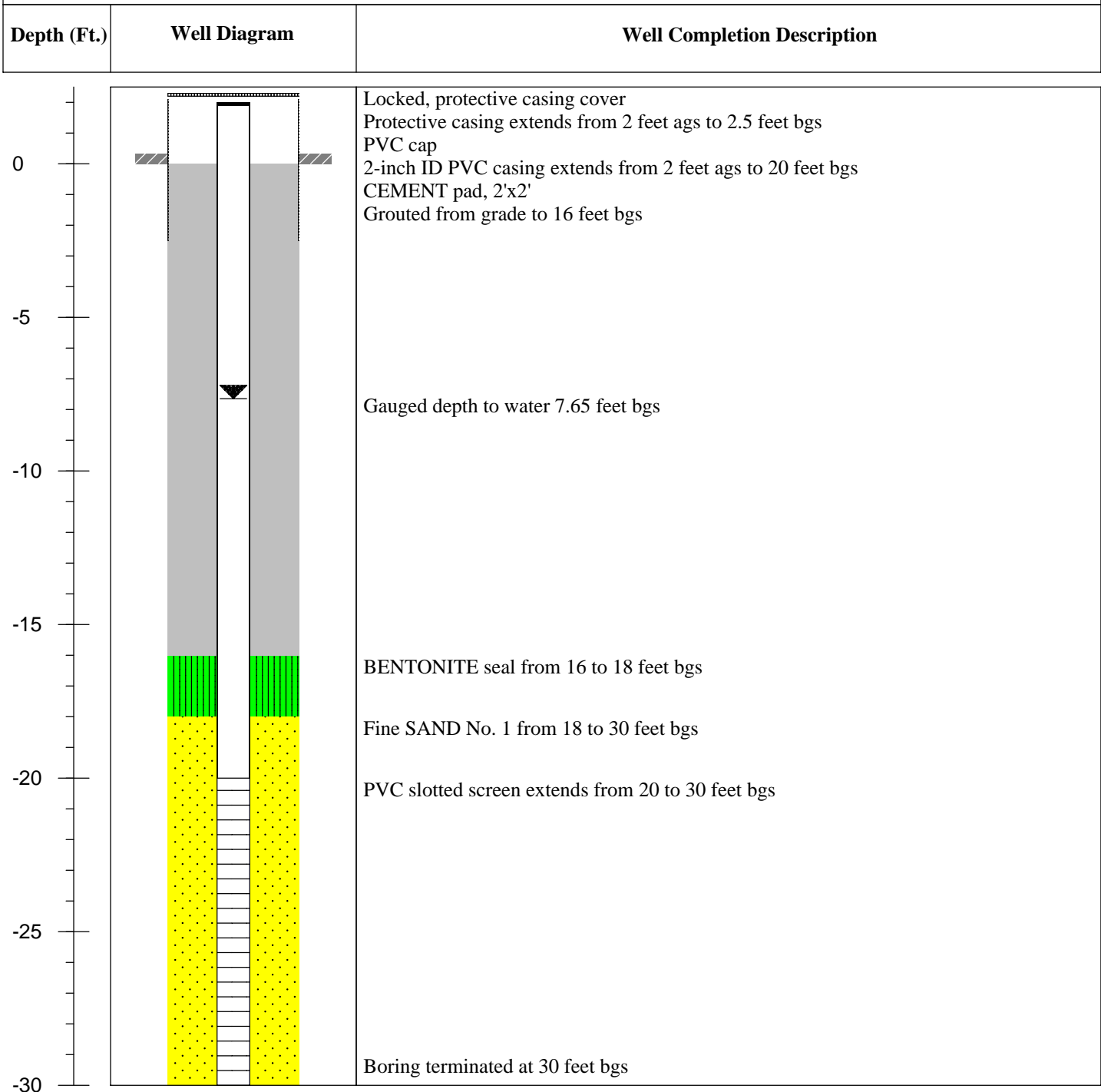
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-11A	<b>Elevation:</b> 11.93	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> EDUARDO SANTIAGO	<b>Start date:</b> 5/15/2007	
<b>Survey Datum:</b> UTM NAD83	<b>Northing (m):</b> 868463.45	<b>Easting (m):</b> 762208.24	<b>End Date:</b> 5/15/2007
<b>Comment:</b> Buchanan, near El Toro Creek			



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** MW-11B

**Elevation:** 11.40

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO

**Start date:** 5/11/2007

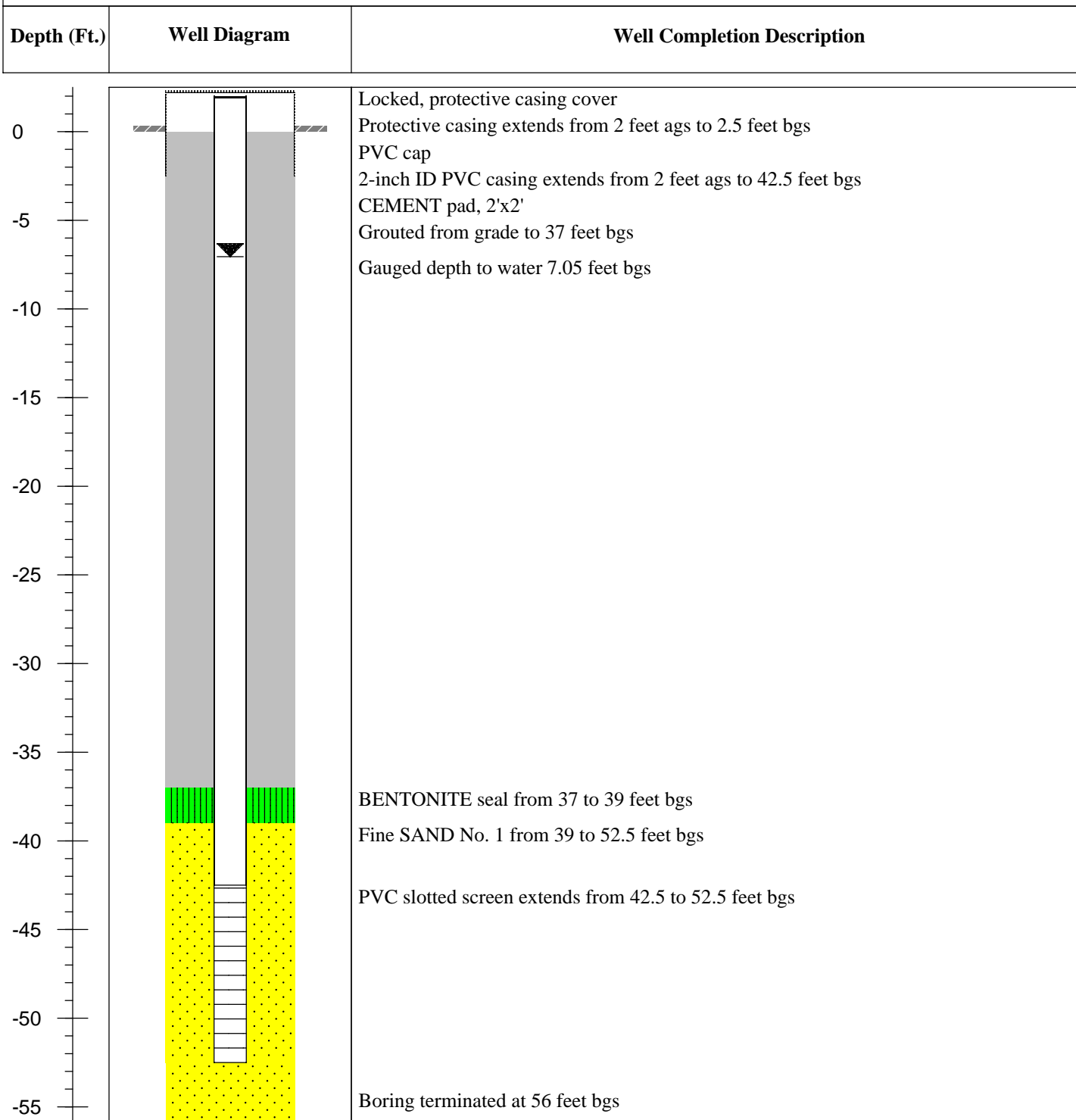
**Survey Datum:** UTM NAD83

**Northing (m):** 868472.99

**Easting (m):** 762204.53

**End Date:** 5/14/2007

**Comment:** Buchanan, near El Toro Creek



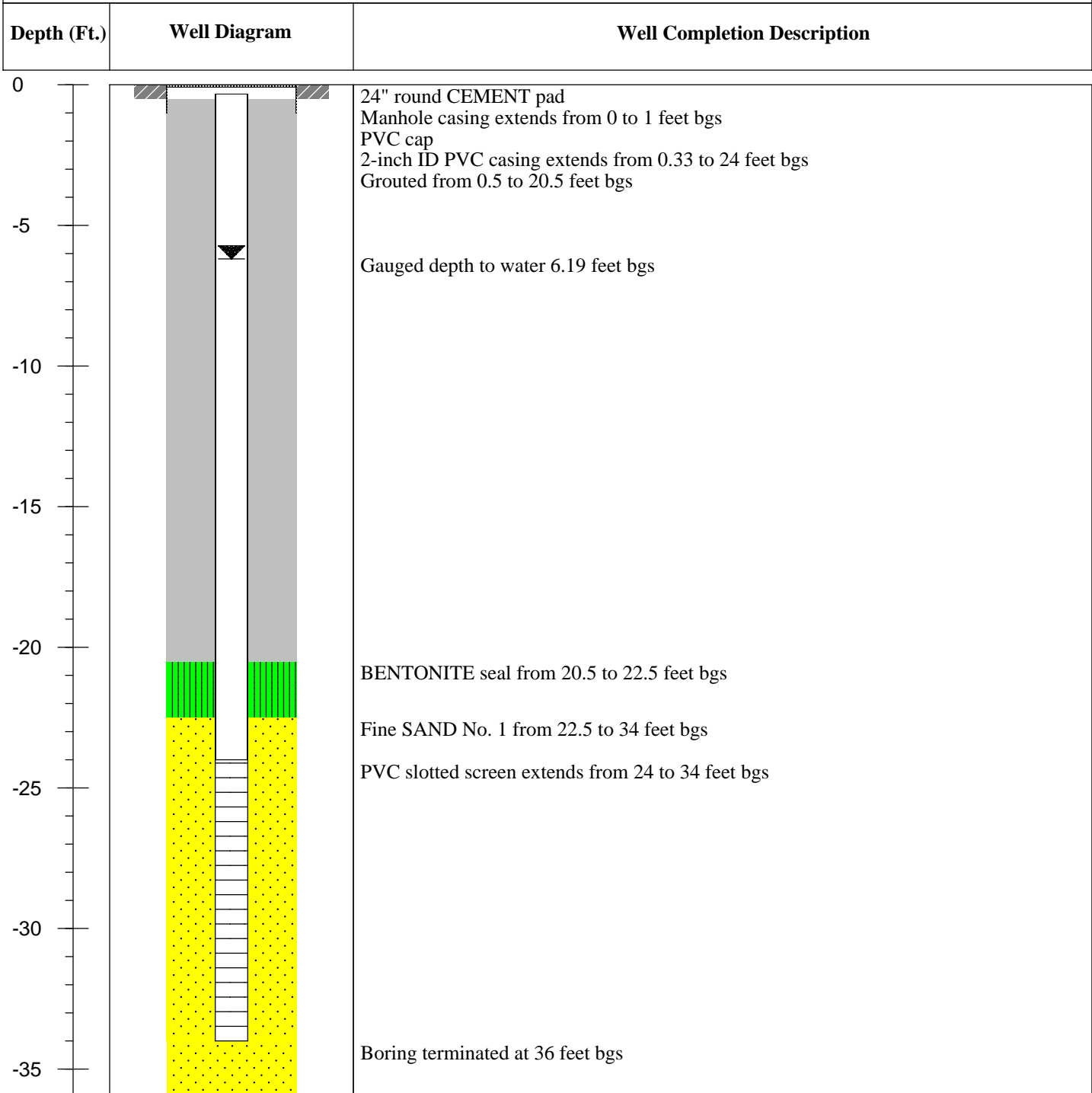
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-12A	<b>Elevation:</b> 10.51	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> EDUARDO SANTIAGO	<b>Start date:</b> 4/27/2007	
<b>Survey Datum:</b> UTM NAD83	<b>Northing (m):</b> 868572.11	<b>Easting (m):</b> 761632.83	<b>End Date:</b> 4/27/2007
<b>Comment:</b> Buchanan, on Perimeter Road near light pole 062			



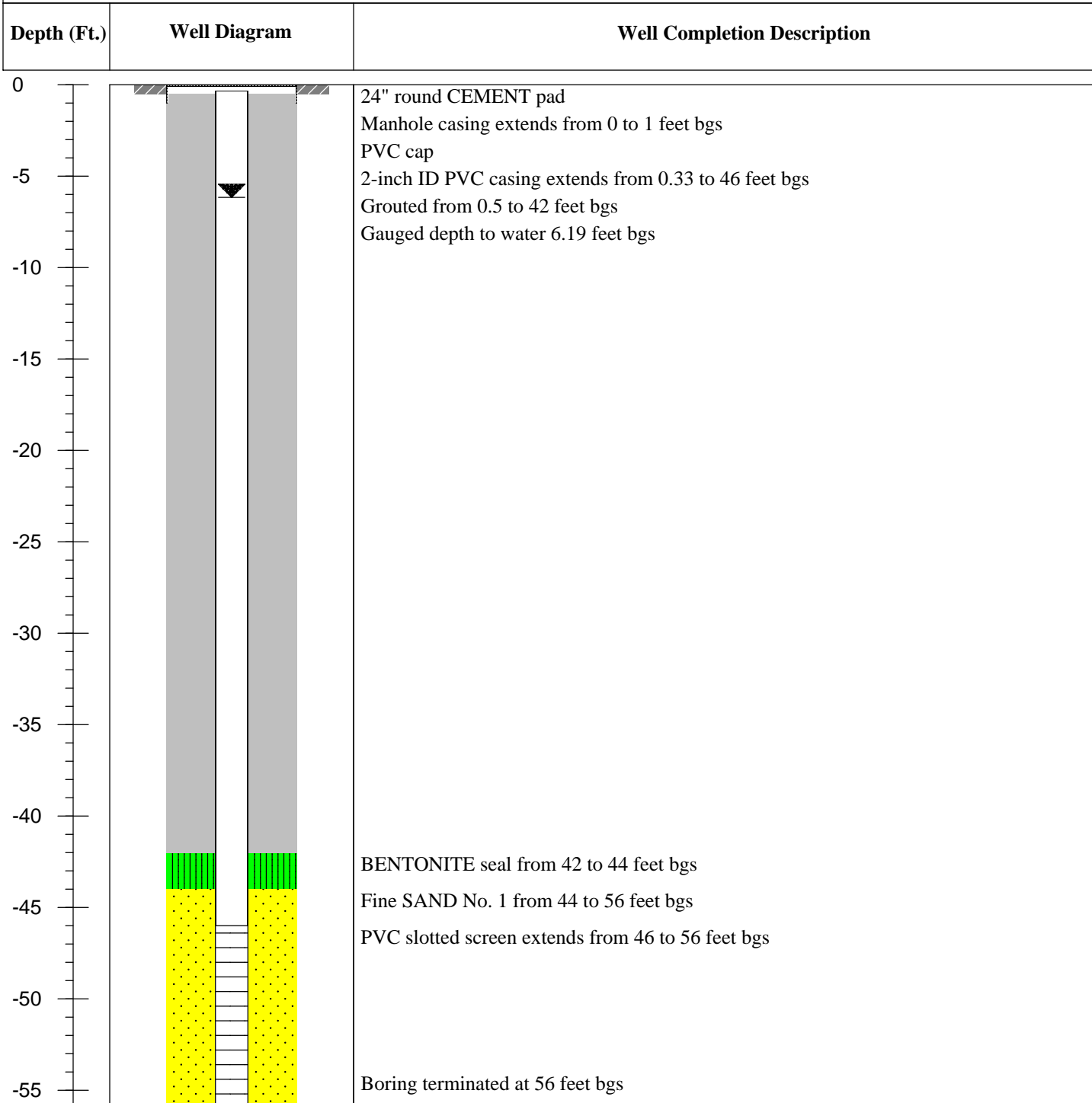
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-12B	<b>Elevation:</b> 10.58	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> EDUARDO SANTIAGO	<b>Start date:</b> 4/30/2007	
<b>Survey Datum:</b> UTM NAD83	<b>Northing (m):</b> 868558.58	<b>Easting (m):</b> 761625.20	<b>End Date:</b> 5/1/2007
<b>Comment:</b> Buchanan, on Perimeter Road near light pole 062			



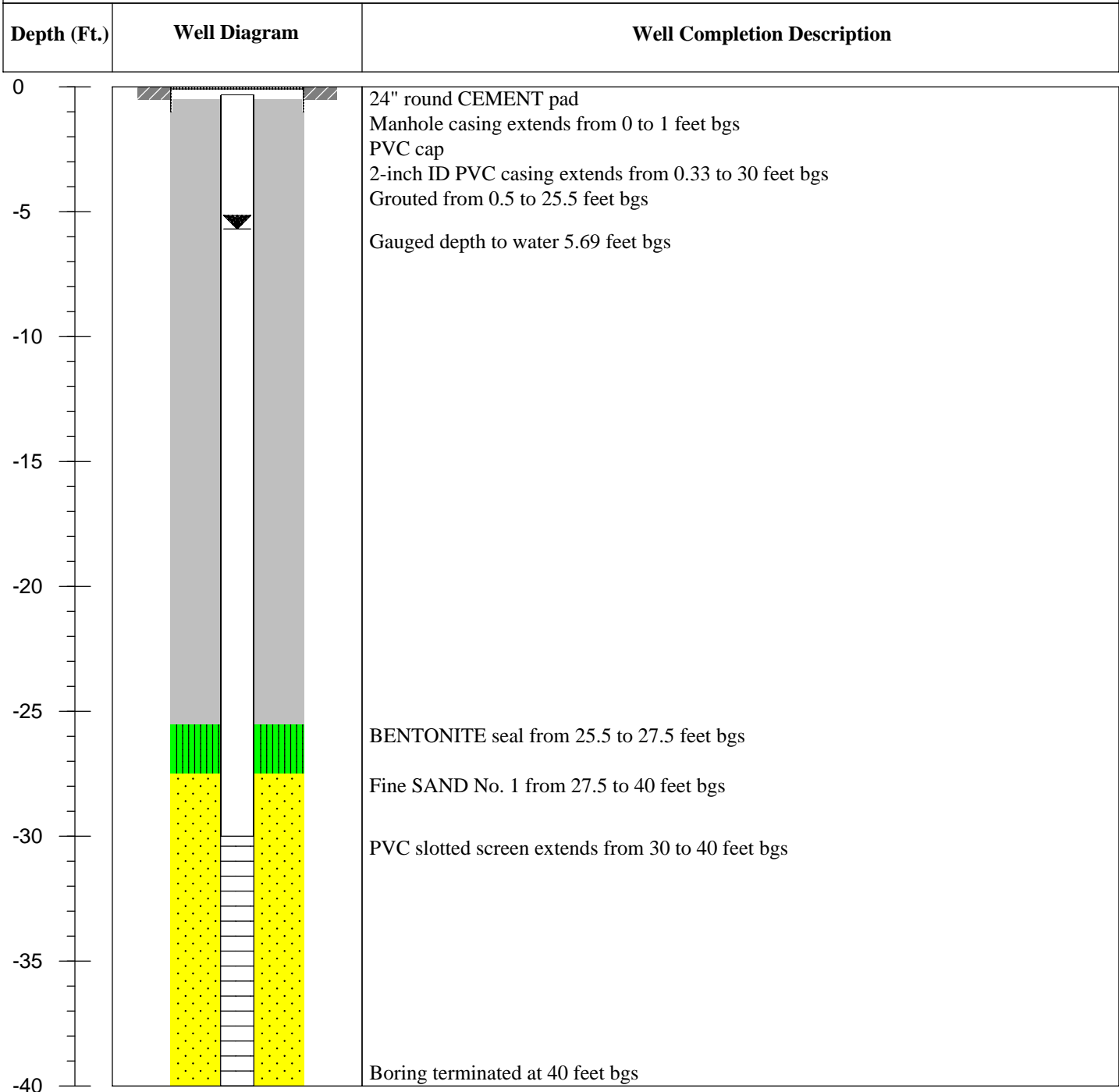
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-13A	<b>Elevation:</b> 10.25	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> EDUARDO SANTIAGO		<b>Start date:</b> 5/8/2007
<b>Survey Datum:</b> UTM NAD83	<b>Northing (m):</b> 869204.47	<b>Easting (m):</b> 762397.50	<b>End Date:</b> 5/8/2007
<b>Comment:</b> Buchanan, grass near back gate on Perimeter Road, near LP 067			





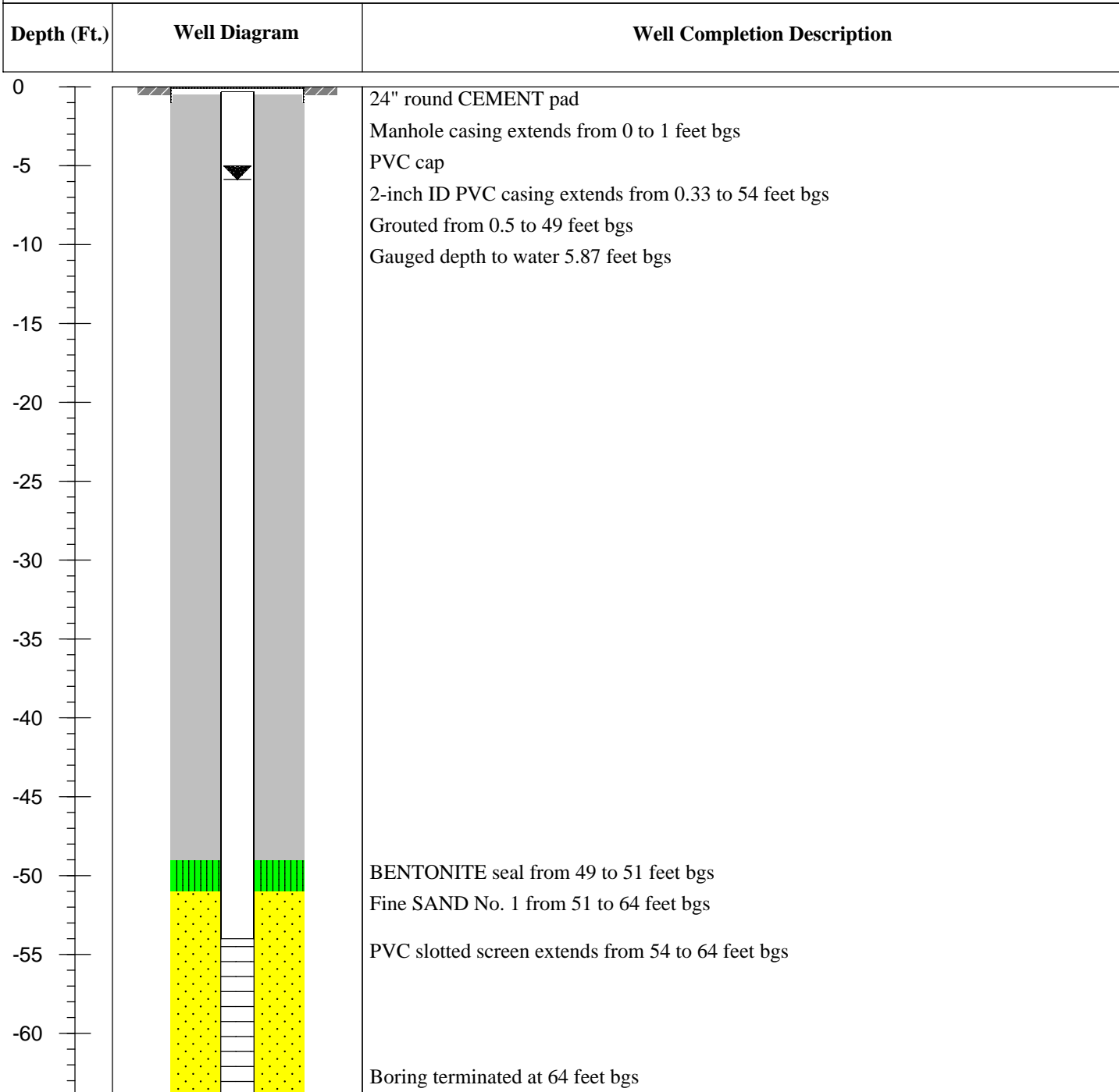
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-13B	<b>Elevation:</b> 10.31	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> EDUARDO SANTIAGO	<b>Start date:</b> 5/2/2007	
<b>Survey Datum:</b> UTM NAD83	<b>Northing (m):</b> 869213.05	<b>Easting (m):</b> 762389.97	<b>End Date:</b> 5/4/2007
<b>Comment:</b> Buchanan, grass on Perimeter Road corner near back gate, LP 067			



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

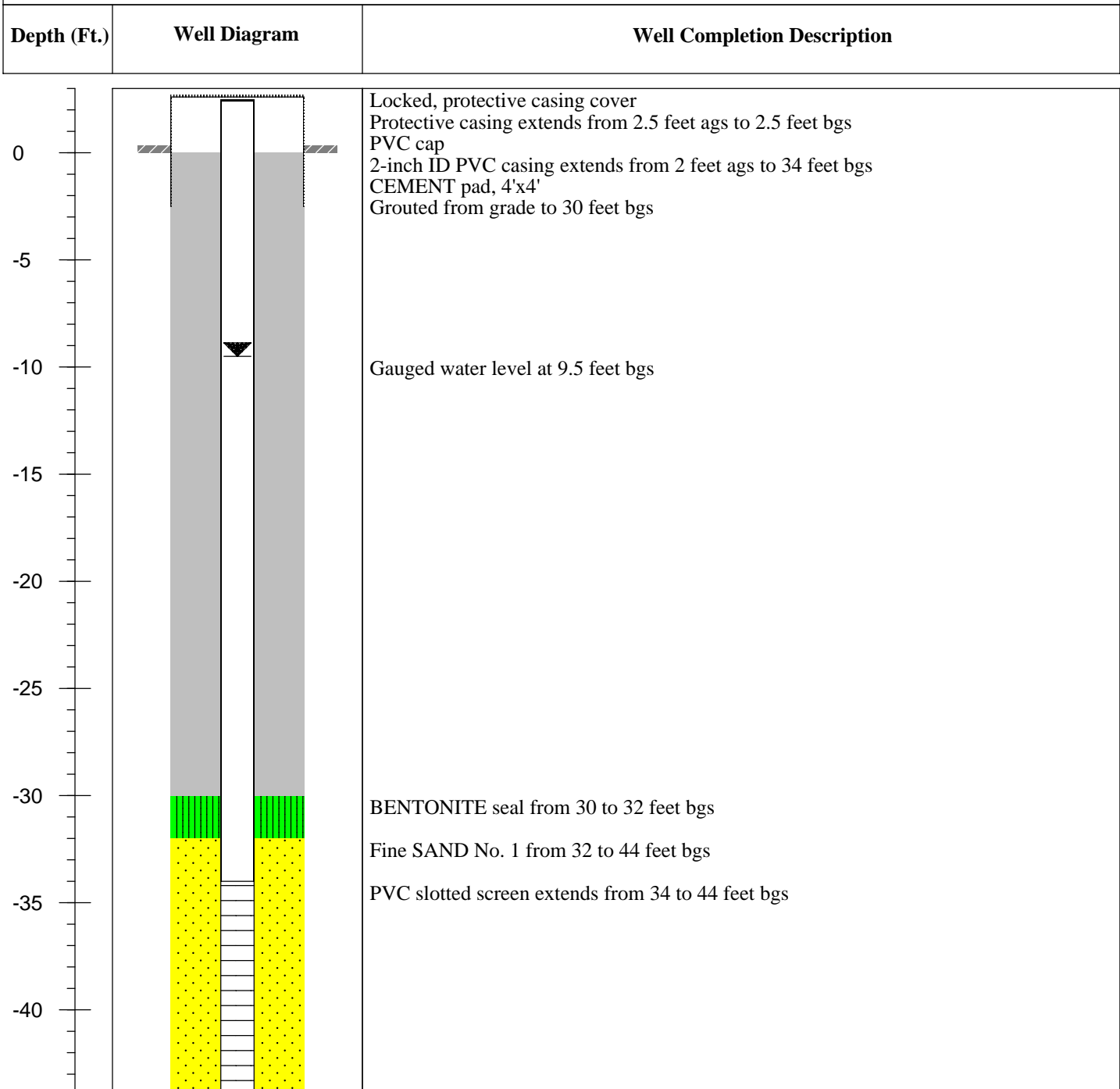
## FORT BUCHANAN

**Well ID:** MW-14A      **Elevation:** 22.16      Ref. Top of Inner PVC Riser      **Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY      **Driller:** EDUARDO SANTIAGO      **Start date:** 12/12/2007

**Survey Datum:** UTM NAD83      **Northing (m):** 867653.23      **Easting (m):** 762300.5      **End Date:** 12/13/2007

**Comment:** Buchanan, east of DPW near creek



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** MW-14B

**Elevation:** 21.71

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO

**Start date:** 12/7/2007

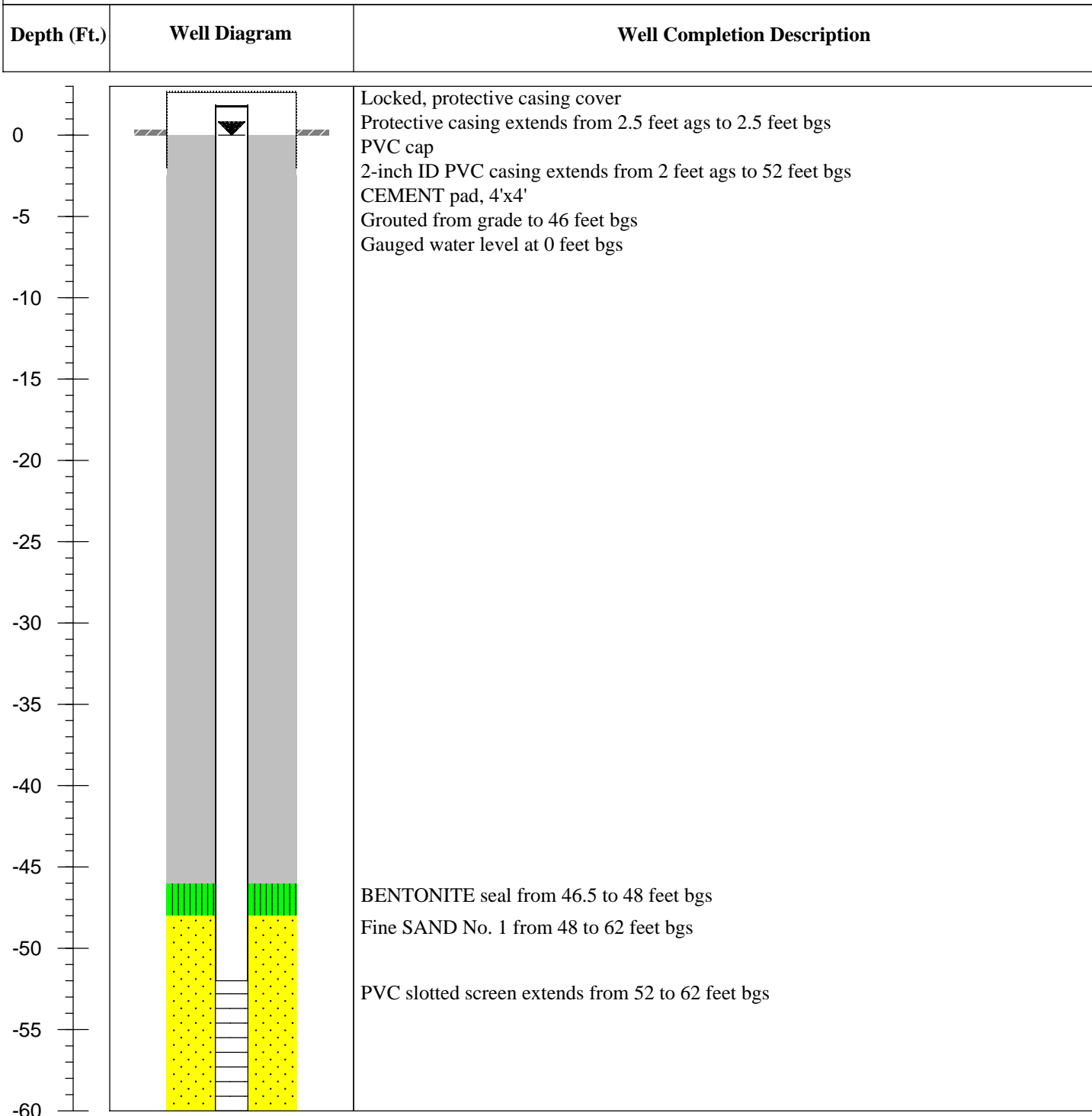
**Survey Datum:** UTM NAD83

**Northing (m):** 867665.24

**Easting (m):** 762299.44

**End Date:** 12/12/2007

**Comment:** Buchanan, east of DPW near creek



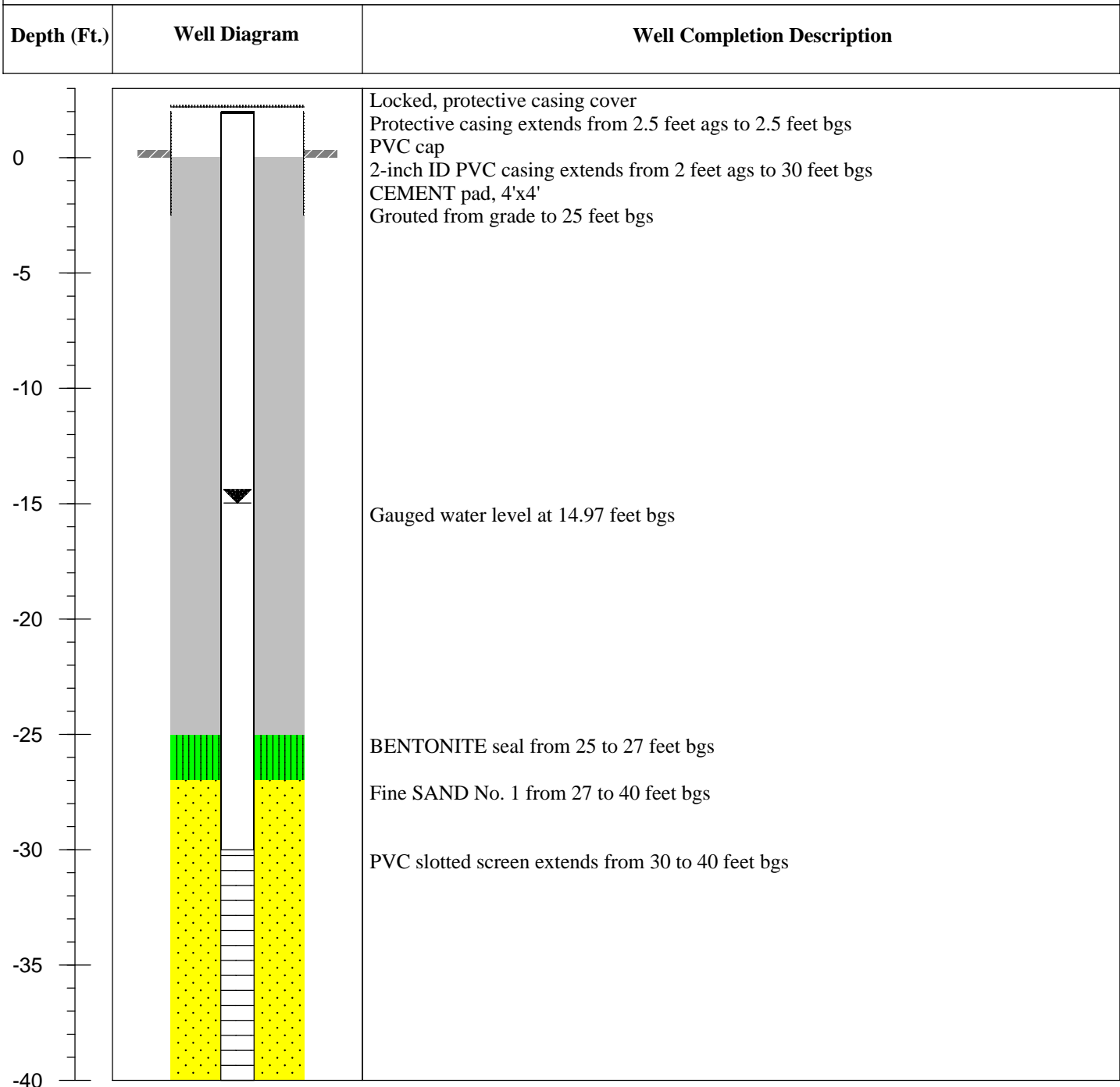
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-15A	<b>Elevation:</b> 19.95	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> EDUARDO SANTIAGO	<b>Start date:</b> 11/16/2007	
<b>Survey Datum:</b> UTM NAD83	<b>Northing (m):</b> 867972.17	<b>Easting (m):</b> 762517.27	<b>End Date:</b> 11/26/2007
<b>Comment:</b> Buchanan			



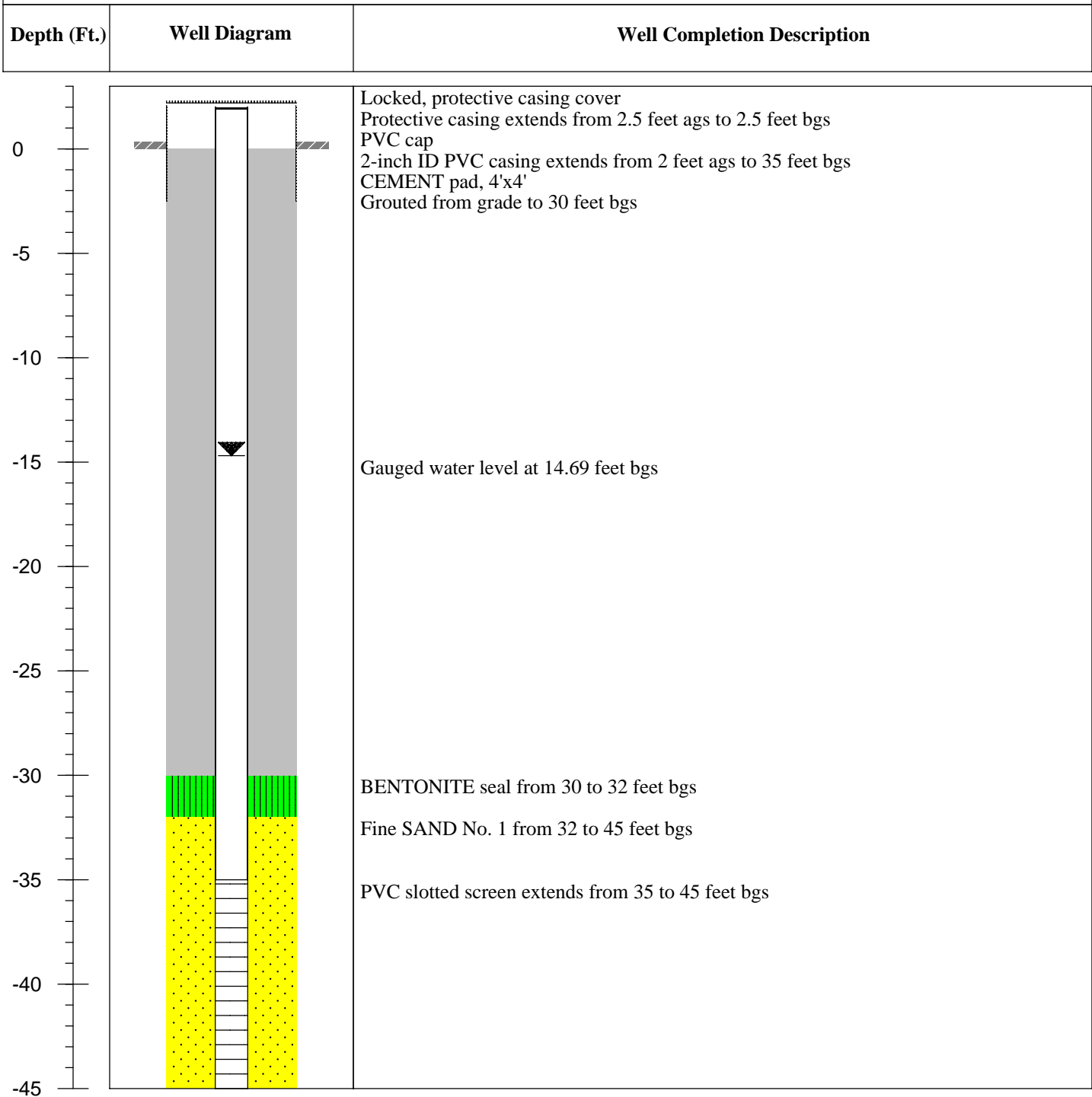
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-16A	<b>Elevation:</b> 20.26	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> EDUARDO SANTIAGO	<b>Start date:</b> 12/3/2007	
<b>Survey Datum:</b> UTM NAD83	<b>Northing (m):</b> 868253.74	<b>Easting (m):</b> 762728.02	<b>End Date:</b> 12/3/2007
<b>Comment:</b> Buchanan, near Vet Clinic			



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

# FORT BUCHANAN

**Well ID: MW-16B**

**Elevation:**20.90

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO

**Start date:**11/30/2007

**Survey Datum:**UTM NAD83

**Northing (m):**868266.63

Easting (m): 762733

**End Date:** 12/3/2007

**Comment:** Buchanan, near Vet Clinic

Depth (Ft.)	Well Diagram	Well Completion Description
0		Locked, protective casing cover Protective casing extends from 2.5 feet ags to 2.5 feet bgs PVC cap 2-inch ID PVC casing extends from 2 feet ags to 52 feet bgs CEMENT pad, 4'x4' Grouted from grade to 48 feet bgs
-5		
-10		
-15		Gauged water level at 15.69 feet bgs
-20		
-25		
-30		
-35		
-40		
-45		
-50		BENTONITE seal from 48 to 50 feet bgs Fine SAND No. 1 from 50 to 62 feet bgs PVC slotted screen extends from 52 to 62 feet bgs
-55		
-60		

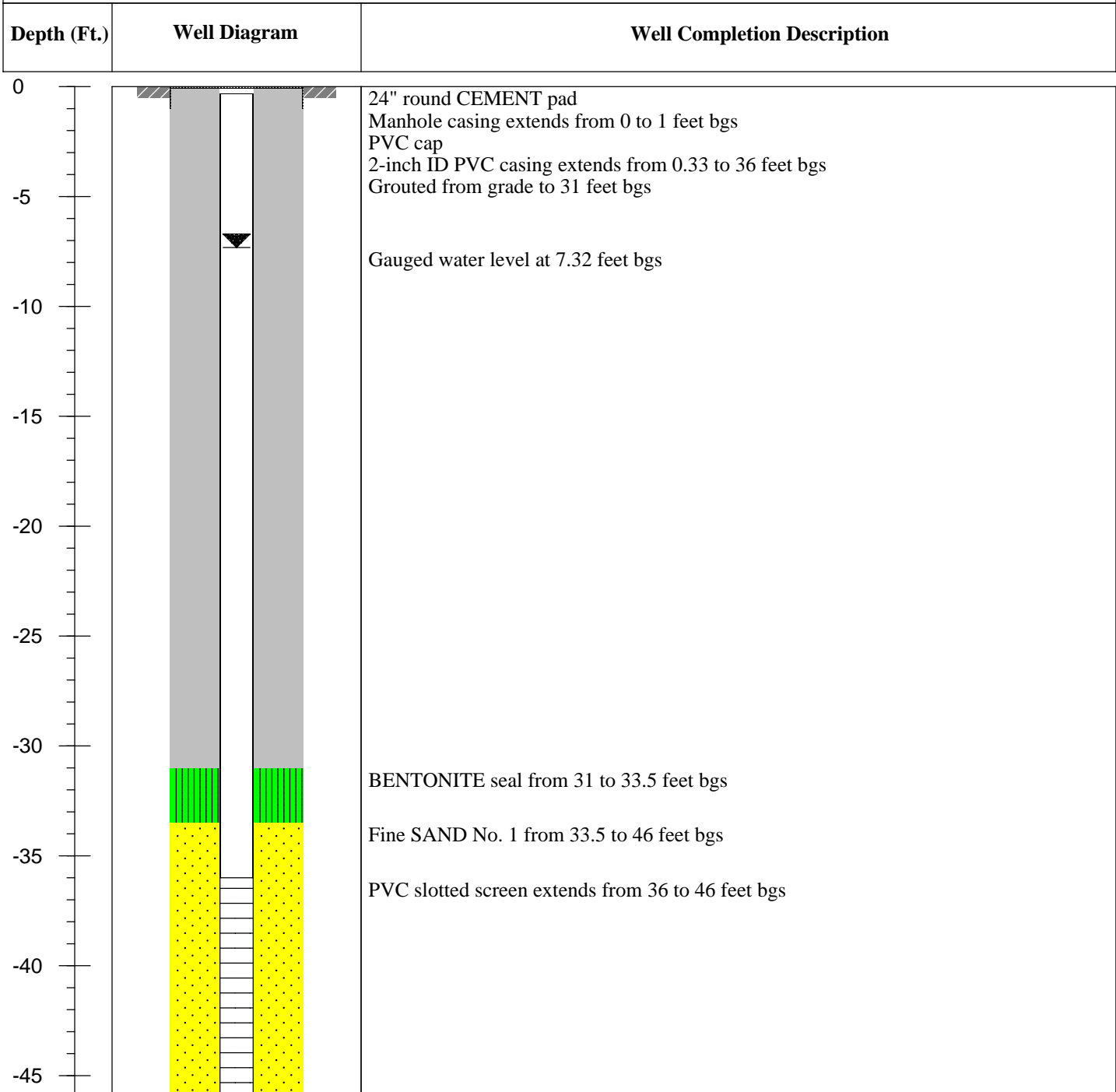
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-17A	<b>Elevation:</b> 15.92	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> EDUARDO SANTIAGO		<b>Start date:</b> 12/6/2007
<b>Survey Datum:</b> UTM NAD83	<b>Northing (m):</b> 868669.72	<b>Easting (m):</b> 763170.59	<b>End Date:</b> 12/6/2007
<b>Comment:</b> Buchanan, in commissary lot			



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

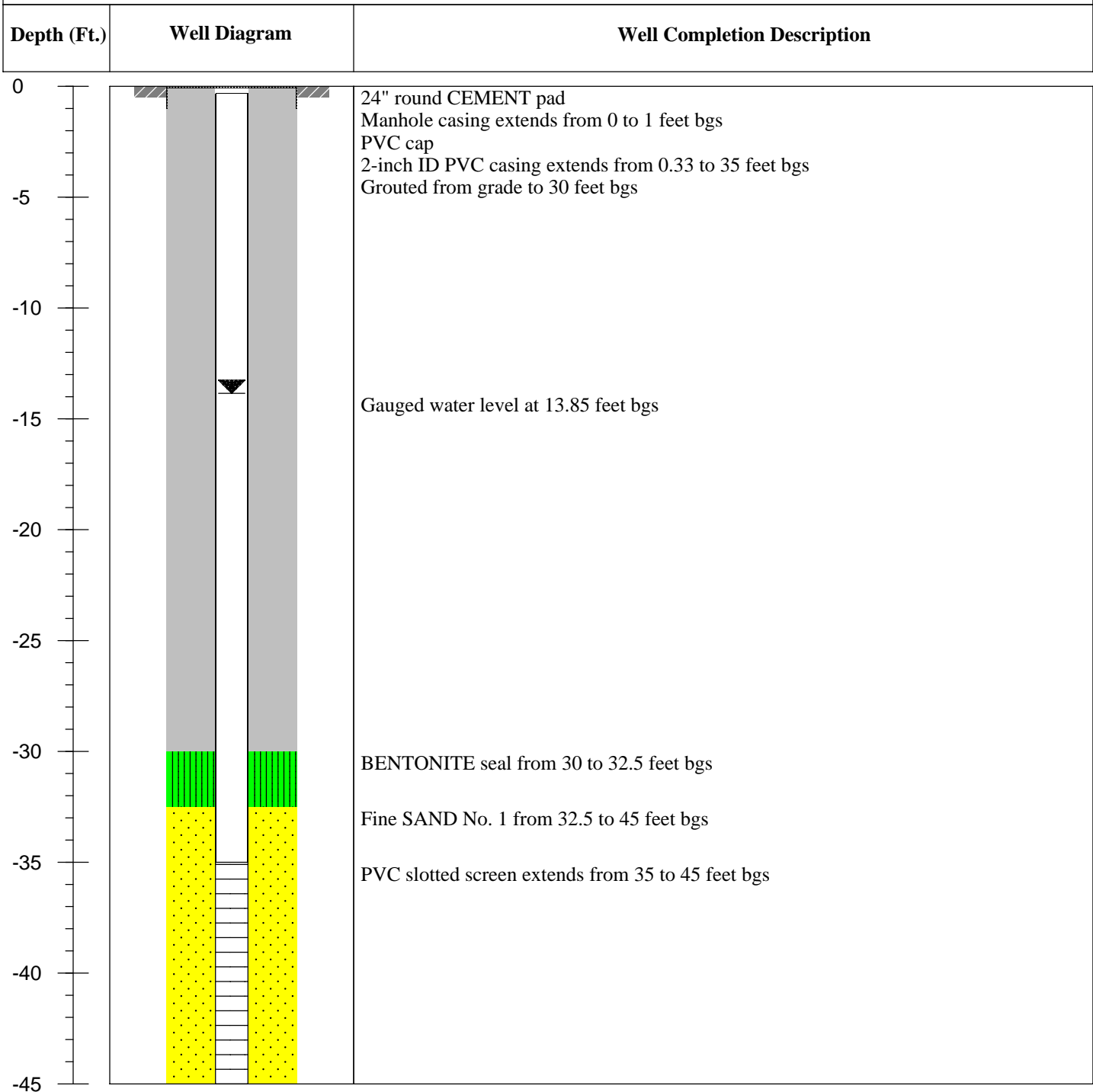
## FORT BUCHANAN

**Well ID:** MW-18A      **Elevation:** 19.45      Ref. Top of Inner PVC Riser      **Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY      **Driller:** EDUARDO SANTIAGO      **Start date:** 12/17/2007

**Survey Datum:** UTM NAD83      **Northing (m):** 868072.43      **Easting (m):** 763428.87      **End Date:** 12/17/2007

**Comment:** Buchanan, in Army Reserve parking lot





# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

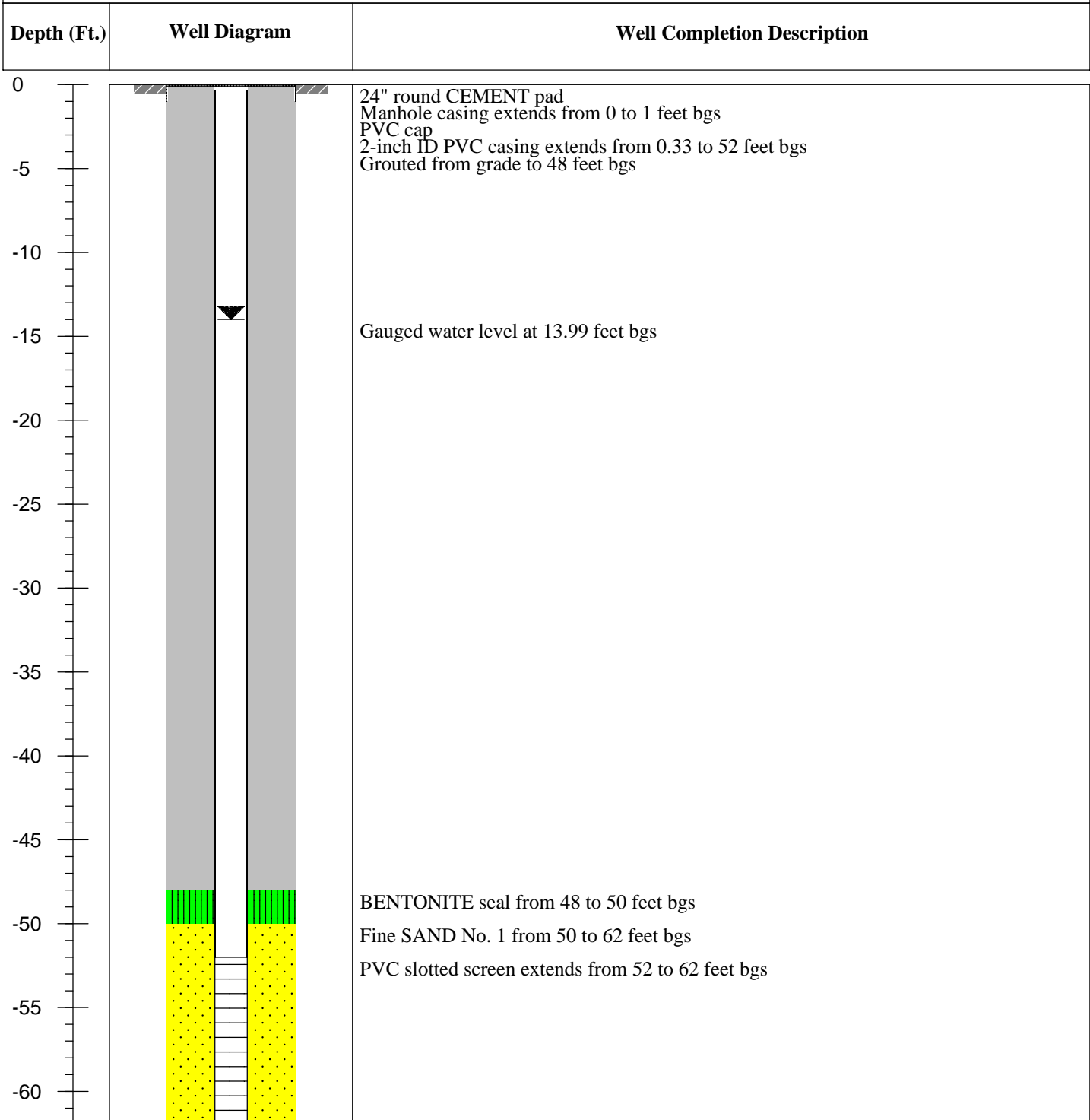
## FORT BUCHANAN

**Well ID:** MW-18B      **Elevation:** 19.57      Ref. Top of Inner PVC Riser      **Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY      **Driller:** EDUARDO SANTIAGO      **Start date:** 12/13/2007

**Survey Datum:** UTM NAD83      **Northing (m):** 868070.5      **Easting (m):** 763439.44      **End Date:** 12/17/2007

**Comment:** Buchanan, in Army Reserve Lot



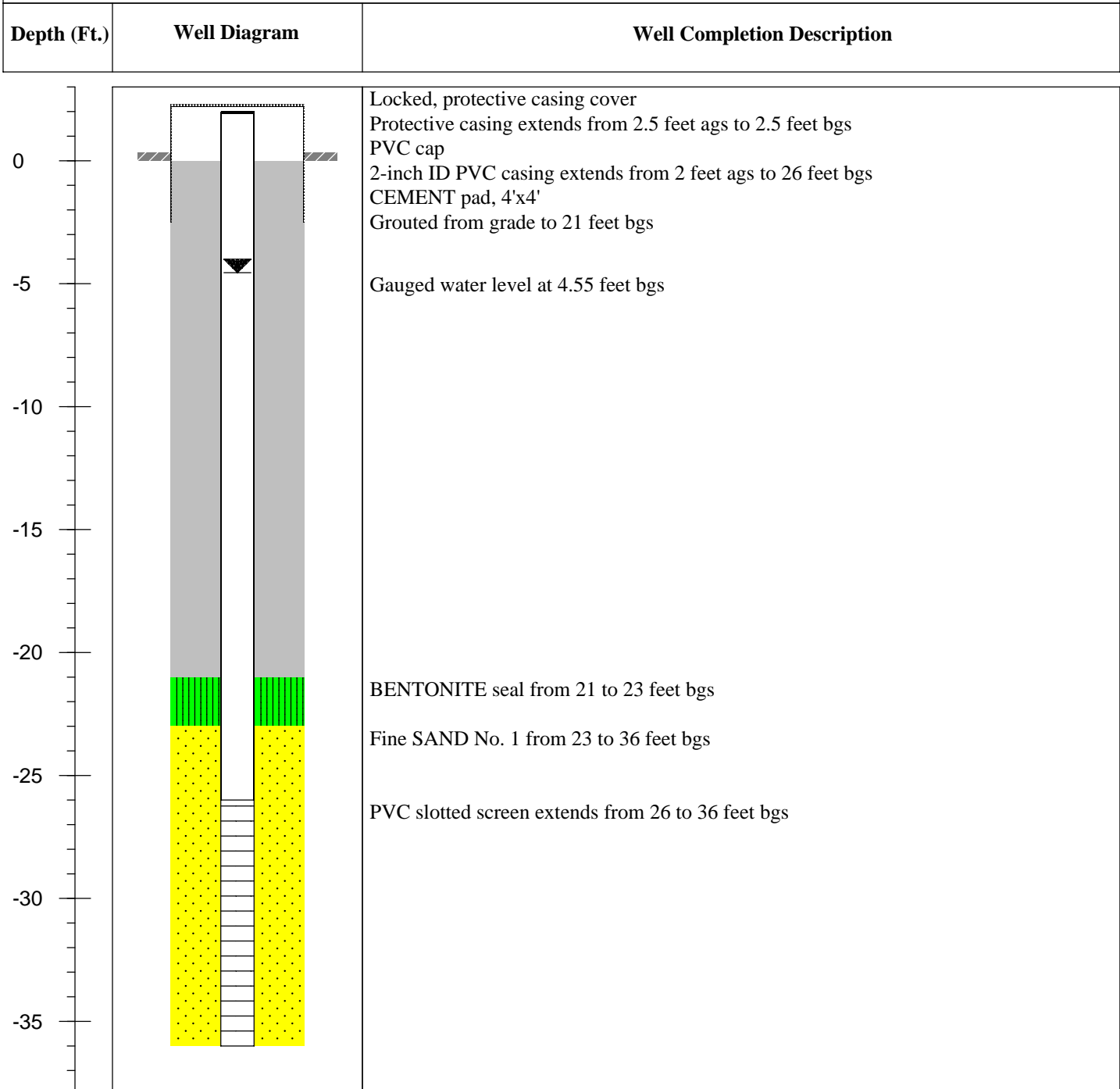
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-19A	<b>Elevation:</b> 28.31	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> EDUARDO SANTIAGO	<b>Start date:</b> 11/28/2007	
<b>Survey Datum:</b> UTM NAD83	<b>Northing (m):</b> 867330.27	<b>Easting (m):</b> 763313.61	<b>End Date:</b> 11/29/2007
<b>Comment:</b> Buchanan, near Lake			



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

# FORT BUCHANAN

**Well ID: MW-19B**

**Elevation:**28.25

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** EDUARDO SANTIAGO**Start date:**11/27/2007

**Survey Datum:**UTM NAD83

**Northing (m):**867329.04

**Easting (m):** 763325.48

**End Date:** 11/28/2007

**Comment:** Buchanan, near Lake

[illegible]

# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** MW-20

**Elevation:** 23.90

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** FLOR RIVERA

**Start date:** 4/22/2008

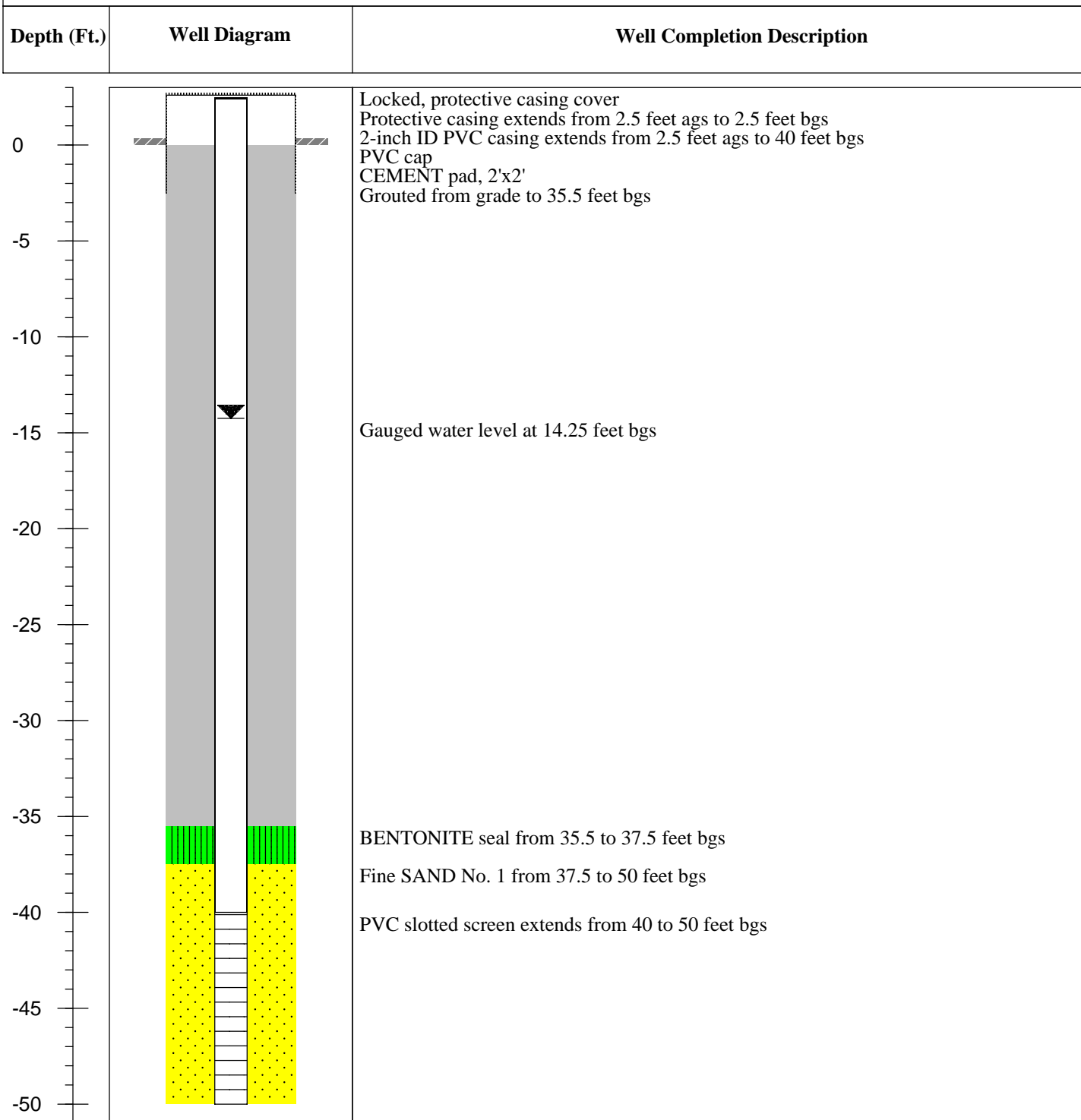
**Survey Datum:** UTM NAD83

**Northing (m):** 867822.8646

**Easting (m):** 762620.3149

**End Date:** 4/23/2008

**Comment:** Buchanan



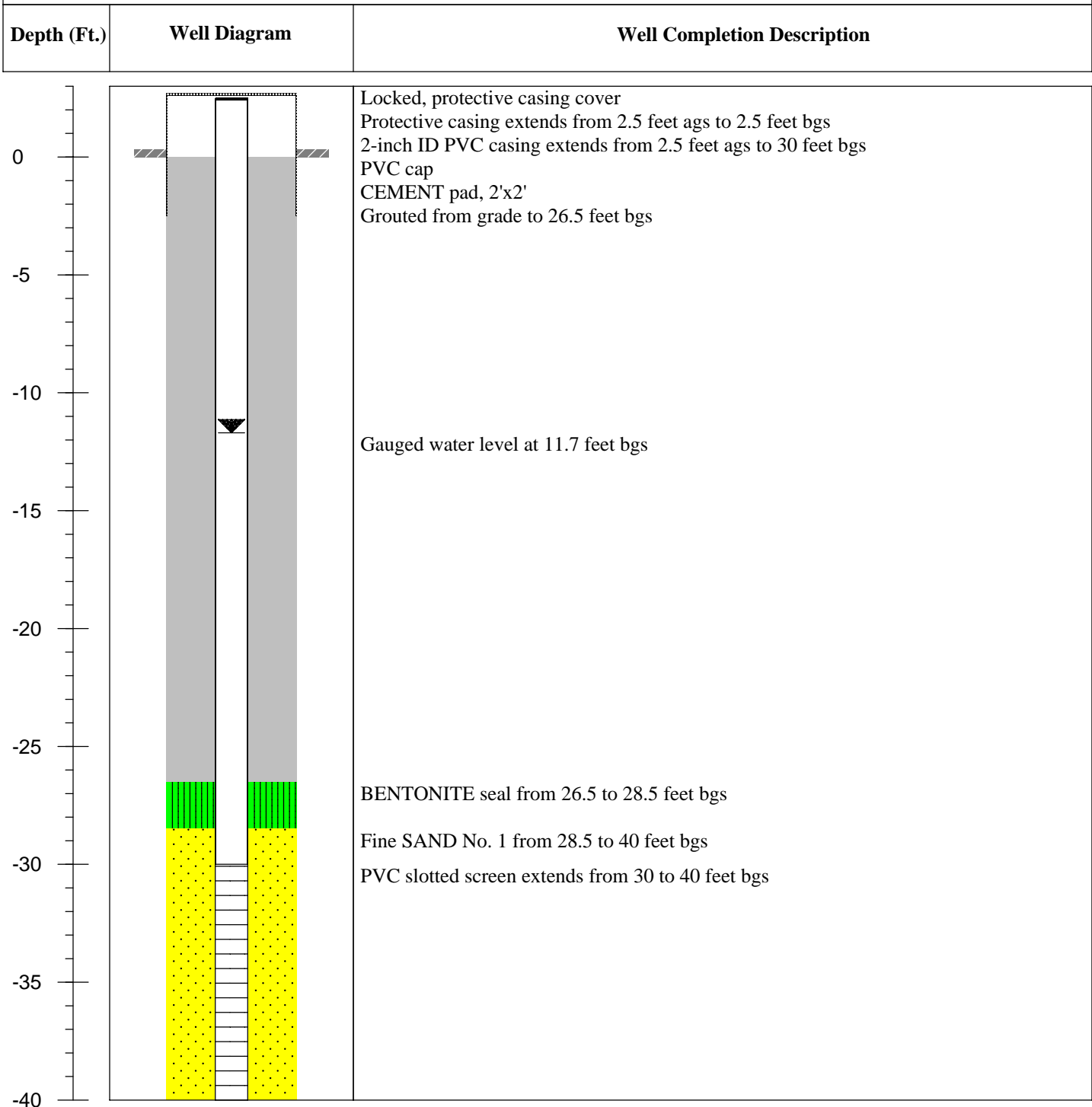
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-21	<b>Elevation:</b> 25.12	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> FLOR RIVERA		<b>Start date:</b> 4/15/2008
<b>Survey Datum:</b> UTM NAD83 <b>Northing (m):</b> 867660.5503 <b>Easting (m):</b> 762681.5519 <b>End Date:</b> 4/15/2008			
<b>Comment:</b> Buchanan			



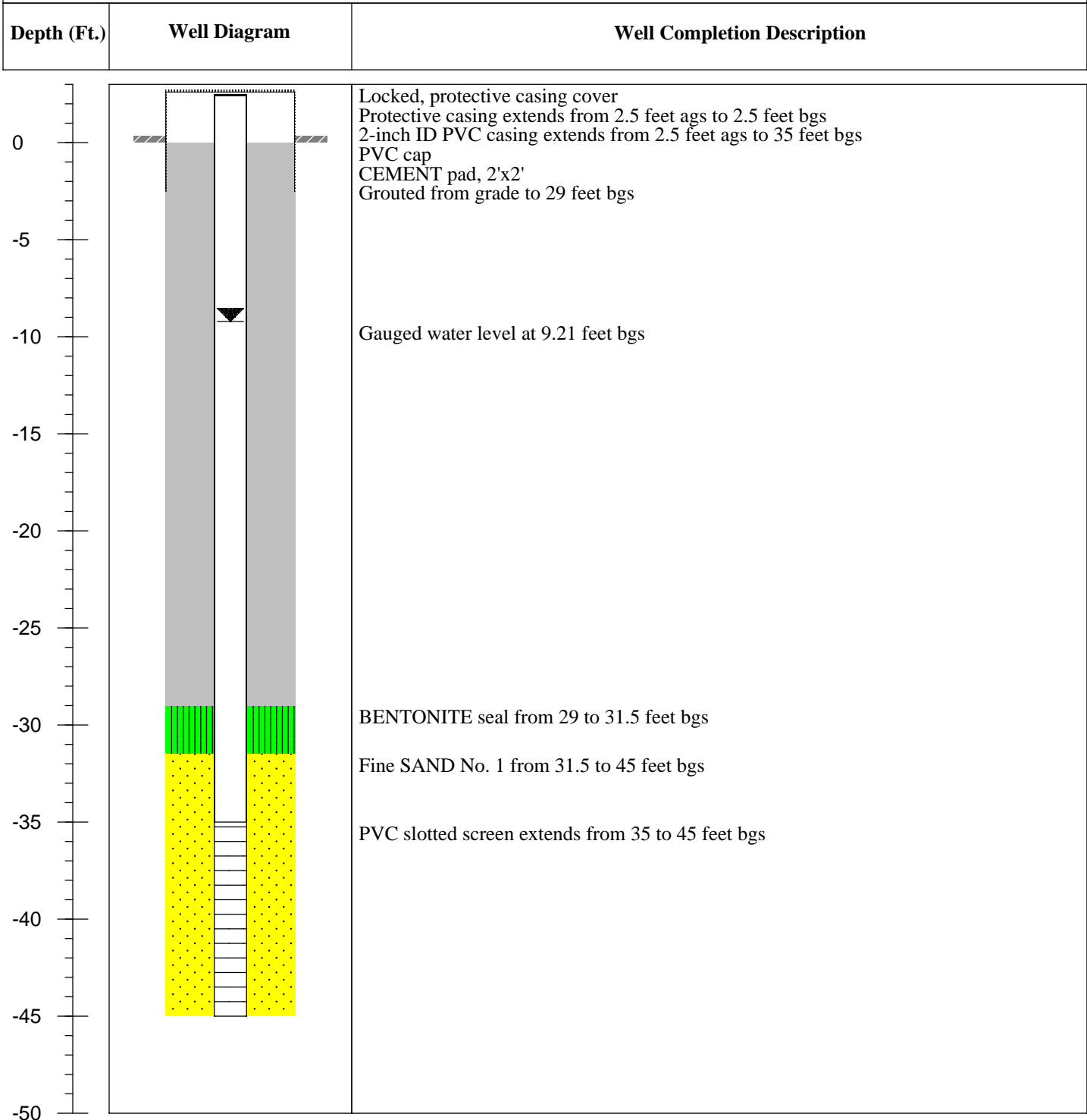
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-22	<b>Elevation:</b> 22.41	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> FLOR RIVERA	<b>Start date:</b> 4/16/2008	
<b>Survey Datum:</b> UTM NAD83 <b>Northing (m):</b> 867935.4267 <b>Easting (m):</b> 763032.7310 <b>End Date:</b> 4/17/2008			
<b>Comment:</b> Buchanan			



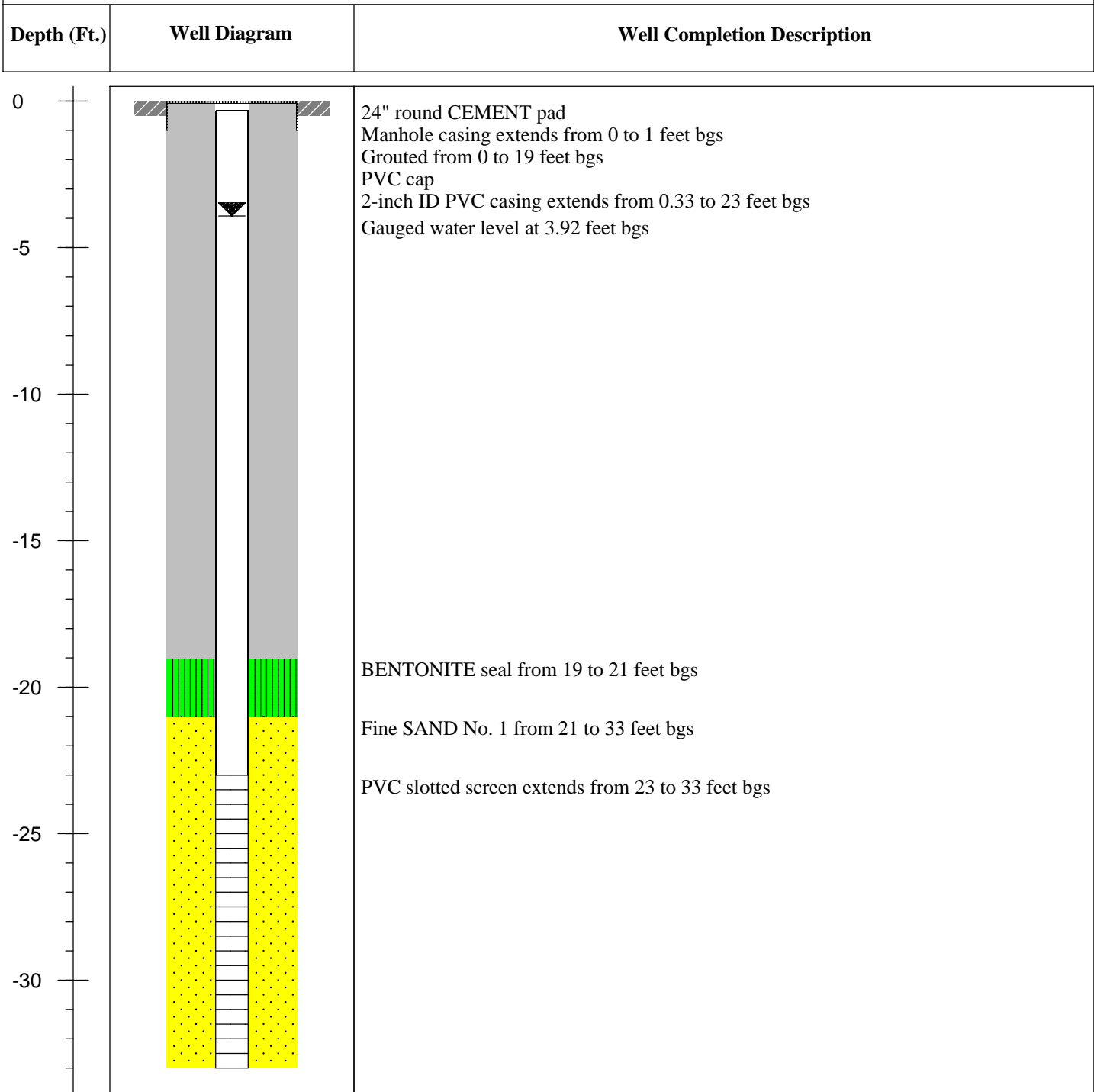
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-23	<b>Elevation:</b> 28.45	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> FLOR RIVERA		<b>Start date:</b> 4/21/2008
<b>Survey Datum:</b> UTM NAD83 <b>Northing (m):</b> 867224.9043 <b>Easting (m):</b> 762468.1612 <b>End Date:</b> 4/21/2008			
<b>Comment:</b> Buchanan			



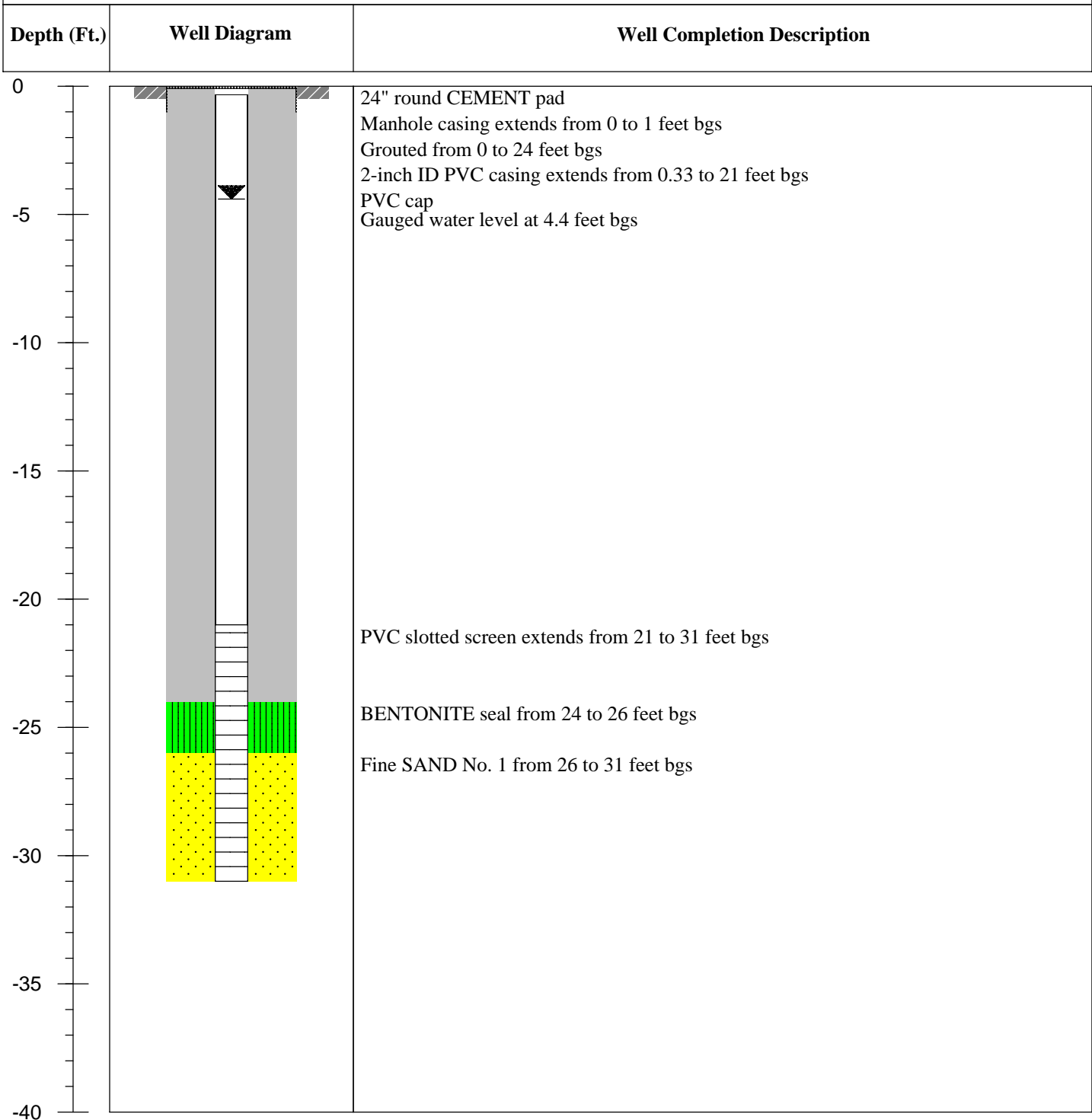
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-24	<b>Elevation:</b> 22.05	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> FLOR RIVERA	<b>Start date:</b> 4/18/2008	
<b>Survey Datum:</b> UTM NAD83 <b>Northing (m):</b> 867774.7022 <b>Easting (m):</b> 763098.2129 <b>End Date:</b> 4/18/2008			
<b>Comment:</b> Buchanan			





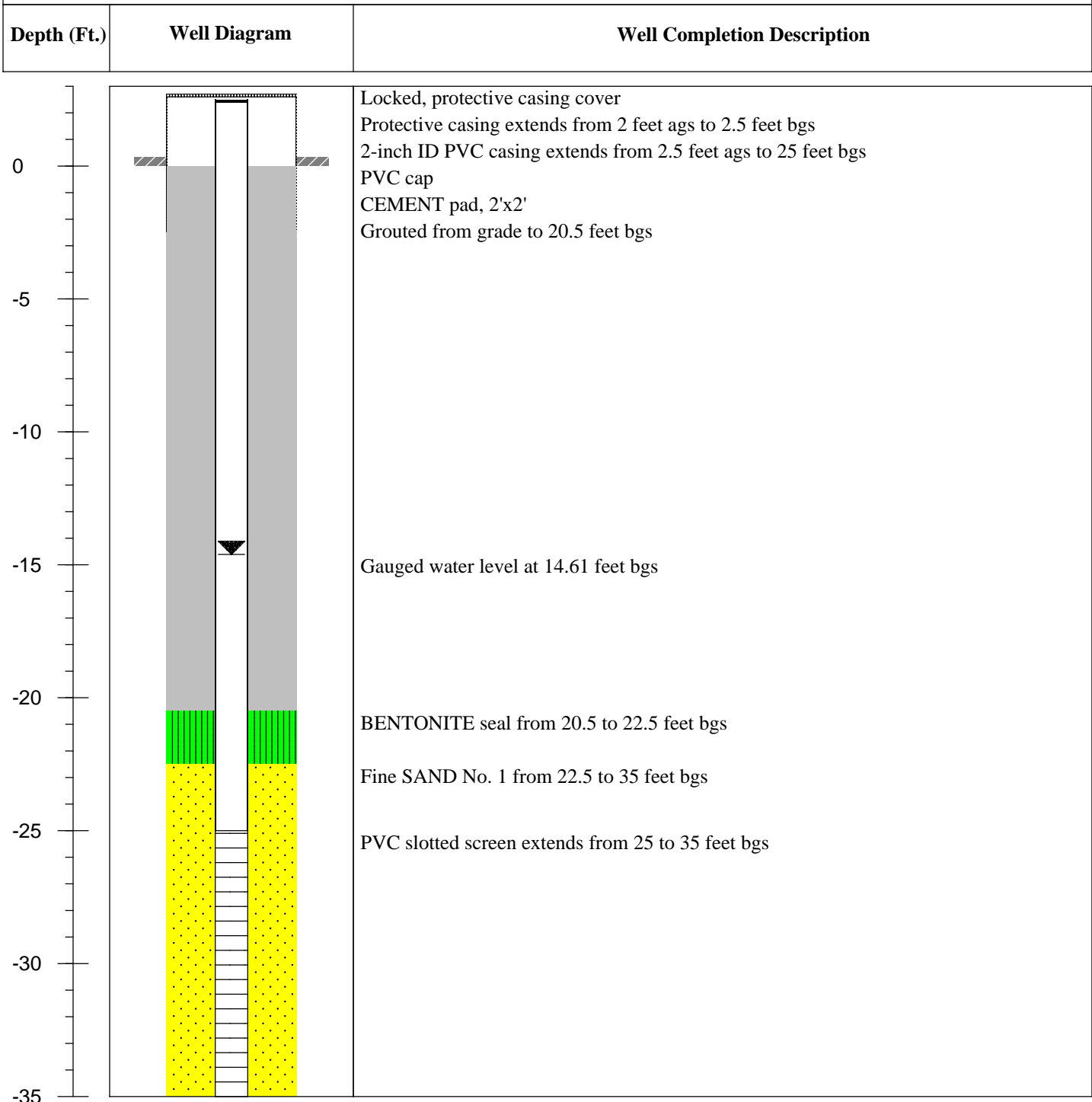
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-25	<b>Elevation:</b> 19.96	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> FLOR RIVERA	<b>Start date:</b> 9/18/2008	
<b>Survey Datum:</b> UTM NAD83 <b>Northing (m):</b> 867786.2588 <b>Easting (m):</b> 762360.9860 <b>End Date:</b> 9/18/2008			
<b>Comment:</b> Buchanan			



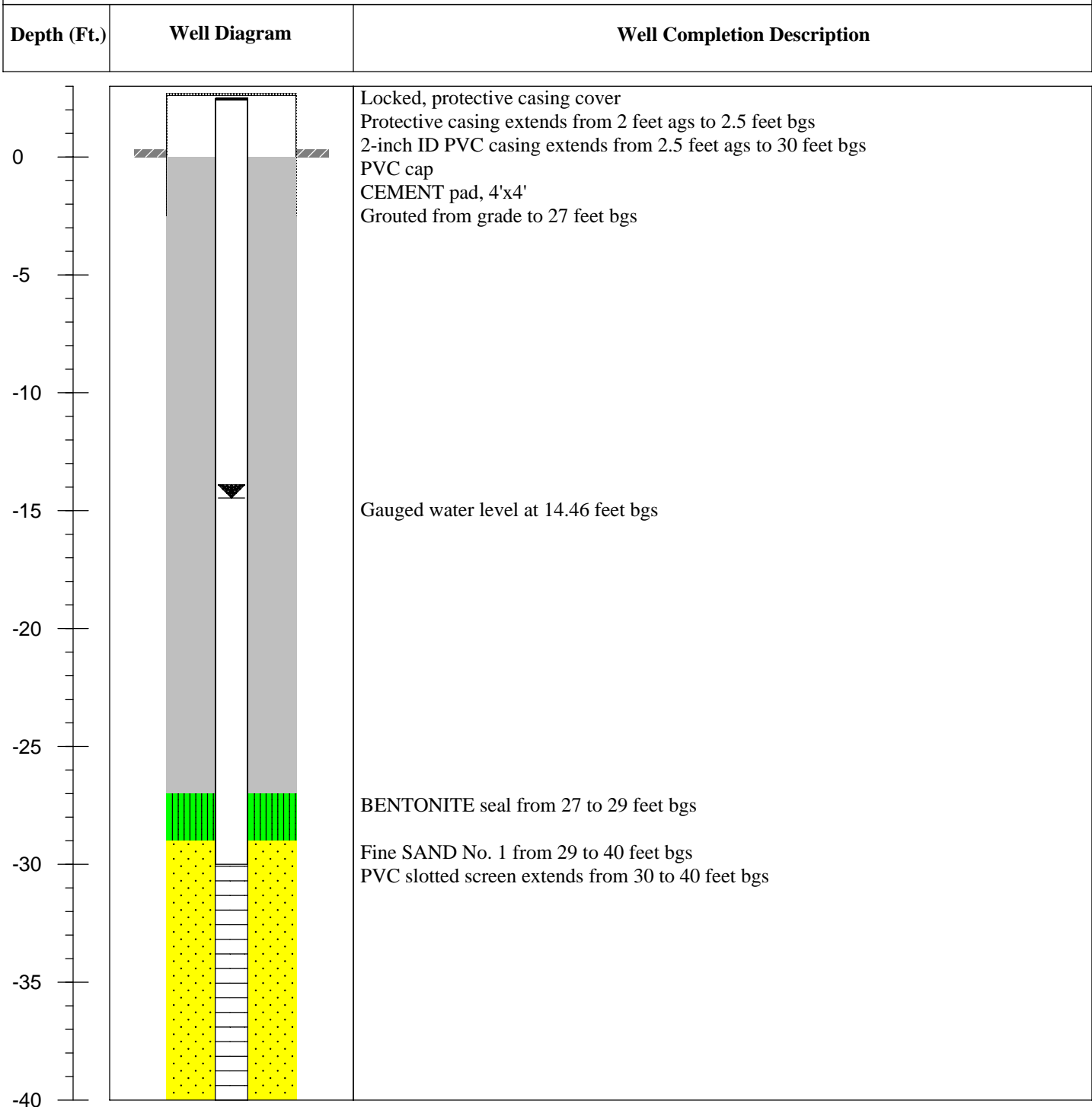
# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

<b>Well ID:</b> MW-26	<b>Elevation:</b> 19.93	Ref. Top of Inner PVC Riser	<b>Elevation Datum:</b> WGS-84
<b>Geologist:</b> BILL HARVEY	<b>Driller:</b> FLOR RIVERA		<b>Start date:</b> 9/15/2008
<b>Survey Datum:</b> UTM NAD83 <b>Northing (m):</b> 867949.2386 <b>Easting (m):</b> 762407.0179 <b>End Date:</b> 9/16/2008			
<b>Comment:</b> Buchanan			



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

# FORT BUCHANAN

**Well ID: OP-1**

**Elevation:**

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** FLOR RIVERA

**Start date:**12/12/2008

**Survey Datum:**UTM NAD83

**Northing (m):**

**Easting (m):**

**End Date:** 12/15/2008

**Comment:** Offpost wells

[illegible]

# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

# FORT BUCHANAN

**Well ID: OP-2**

**Elevation:**

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** FLOR RIVERA

**Start date:**12/17/2008

**Survey Datum:**UTM NAD83

**Northing (m):**

**Easting (m):**

**End Date:** 12/17/2008

**Comment:** Offpost wells

[illegible]

# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** OP-3

**Elevation:**

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** FLOR RIVERA

**Start date:** 12/9/2008

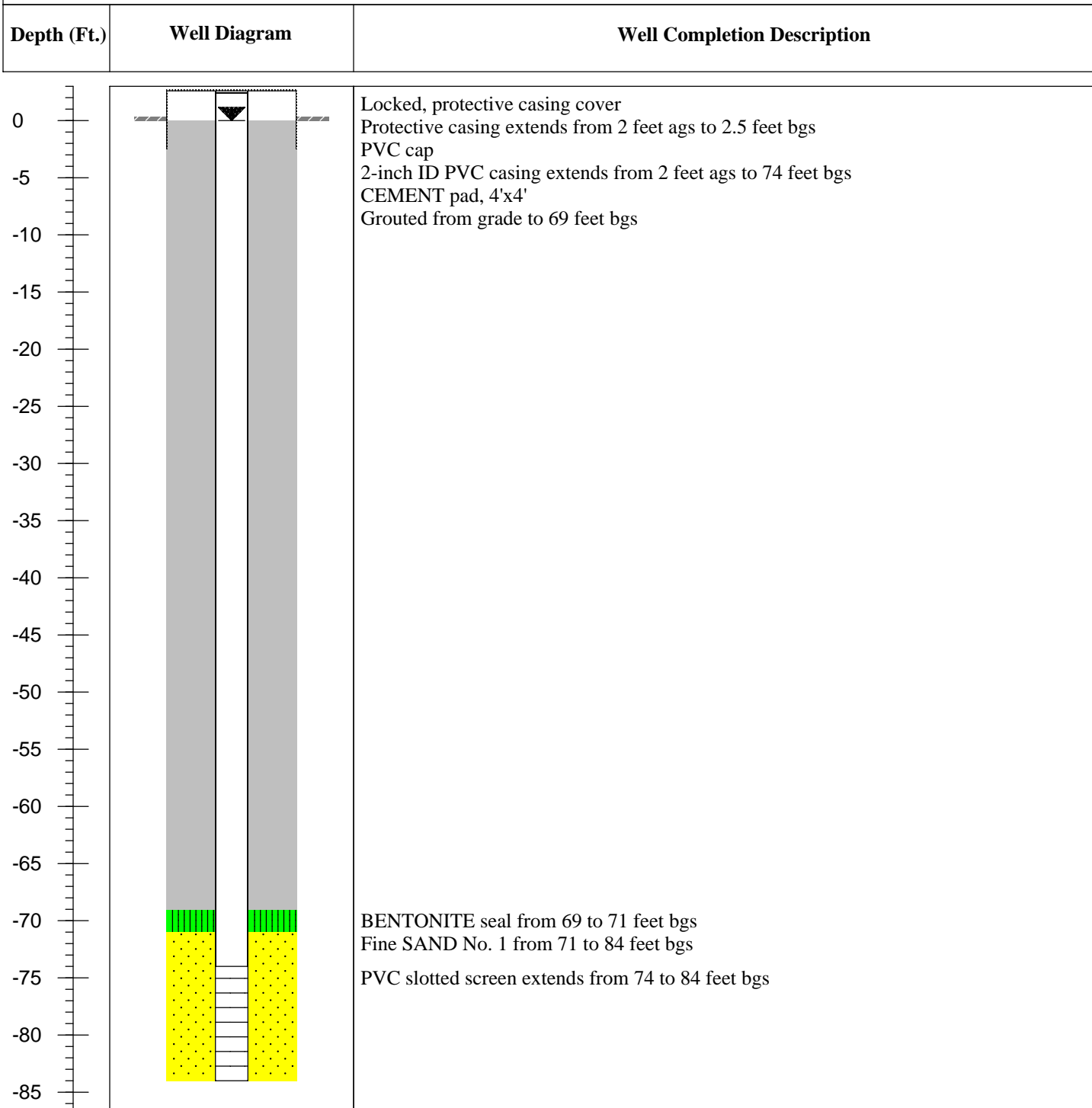
**Survey Datum:** UTM NAD83

**Northing (m):**

**Easting (m):**

**End Date:** 12/10/2008

**Comment:** Buchanan



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

# FORT BUCHANAN

**Well ID: OP-4**

**Elevation:**

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** FLOR RIVERA**Start date:**12/5/2008

**Survey Datum:**UTM NAD83

**Northing (m):**

**Easting (m):**

**End Date:** 12/5/2008

**Comment:** Buchanan

Depth (Ft.)	Well Diagram	Well Completion Description
0 -5 -10 -15 -20 -25 -30 -35 -40 -45 -50 -55 -60 -65 -70 -75 -80	<p>The diagram shows a vertical cross-section of a well. The left side has a depth scale from 0 to -80 feet in increments of 5 feet. The well casing is represented by two parallel vertical lines. From 0 to 64 feet, the area between the casing lines is filled with gray, representing grout. At 64 feet, there is a green hatched band representing a bentonite seal. Below this, from 66 to 80 feet, the area is filled with yellow dots representing fine sand. Within the sand section, from 70 to 80 feet, there are horizontal white bars representing a PVC slotted screen. Above the ground level (0 feet), there is a black inverted triangle symbol representing a protective casing cover.</p>	<p>Locked, protective casing cover Protective casing extends from 2 feet ags to 2.5 feet bgs PVC cap 2-inch ID PVC casing extends from 2 feet ags to 70 feet bgs CEMENT pad, 4'x4' Grouted from grade to 64 feet bgs</p> <p>BENTONITE seal from 64 to 66 feet bgs Fine SAND No. 1 from 66 to 80 feet bgs</p> <p>PVC slotted screen extends from 70 to 80 feet bgs</p>

# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

**Well ID:** OP-5

**Elevation:**

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** WGS-84

**Geologist:** BILL HARVEY

**Driller:** FLOR RIVERA

**Start date:** 12/1/2008

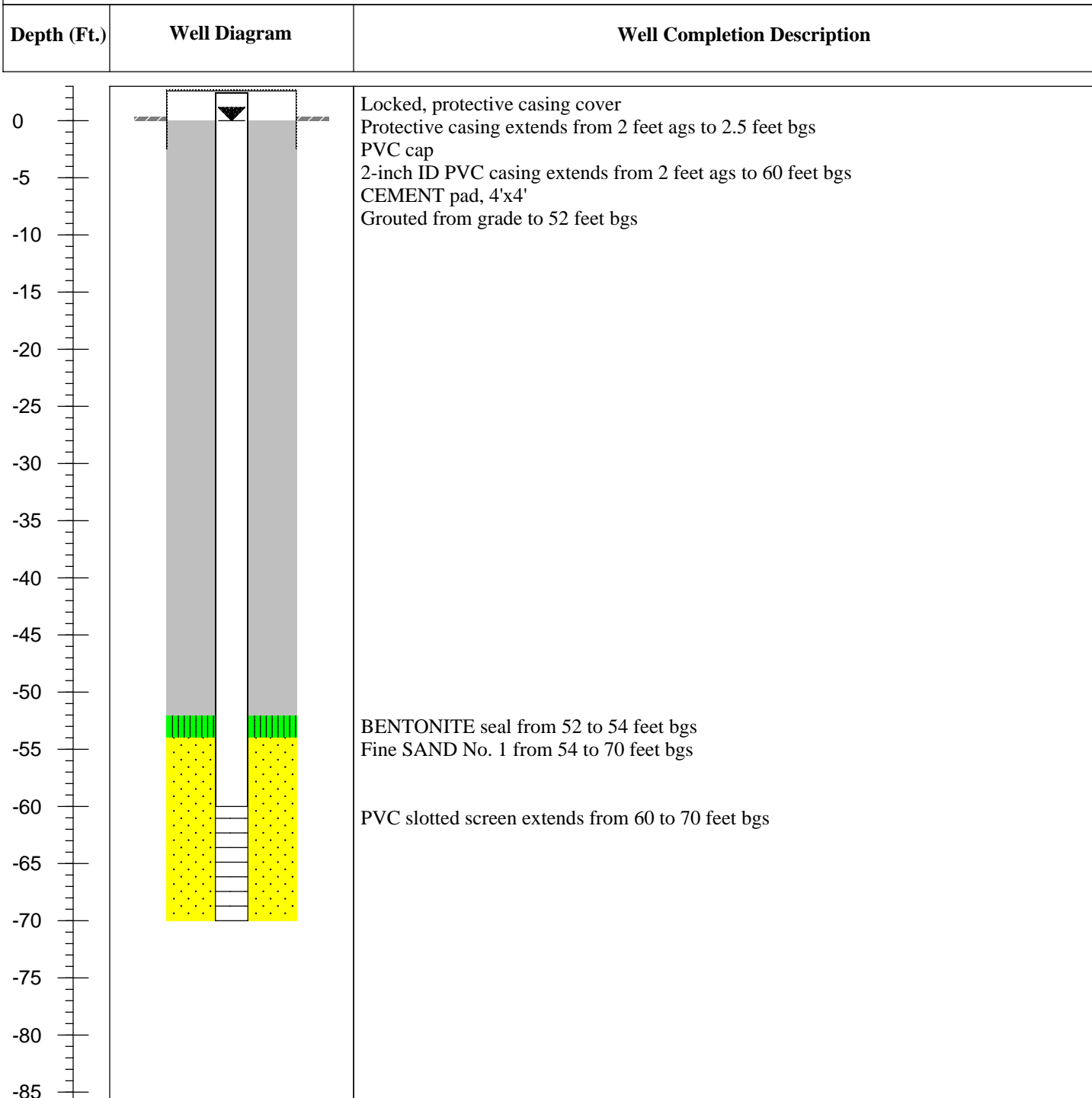
**Survey Datum:** UTM NAD83

**Northing (m):**

**Easting (m):**

**End Date:** 12/3/2008

**Comment:** Offpost wells



# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

# FORT BUCHANAN

**Well ID: OP-6**

**Elevation (ft):**13.47

Ref. Top of  
Inner PVC Riser

**Elevation Datum:** UTM NAD 83

**Geologist:** BILL HARVEY

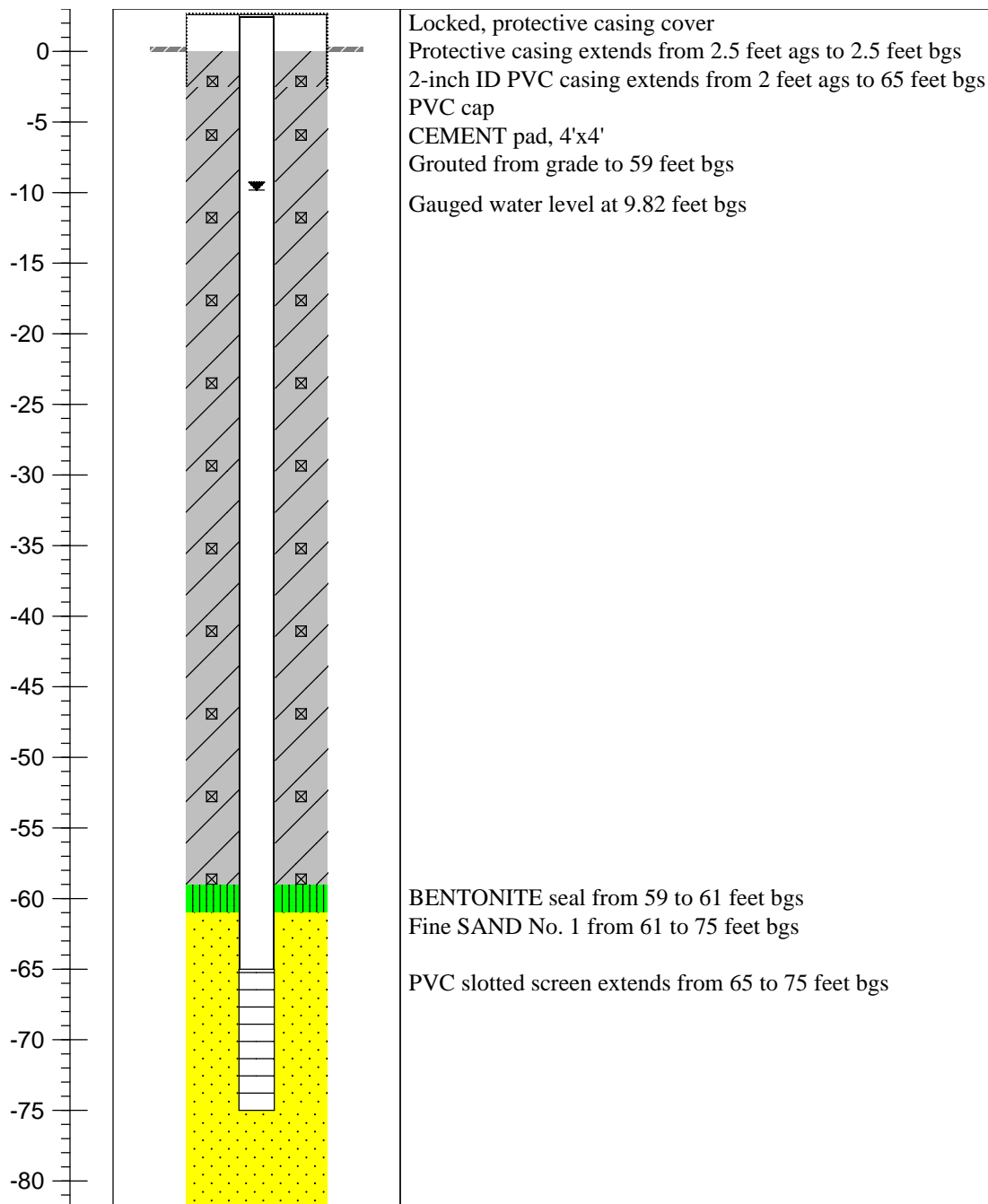
**Driller:** FLOR RIVERA

**Start date:**2/17/2009

**Survey Datum:**UTM NAD83    **Northing (ft):** 871169.7782    **Easting (ft):** 761896.6345    **End Date:** 2/18/2009

**Comment:** Offpost wells

Depth (Ft.)	Well Diagram	Well Completion Description
-------------	--------------	-----------------------------





# WELL CONSTRUCTION DIAGRAM



1319 Woodbridge Station Way, Suite 200  
Edgewood, MD 21040  
410-538-8202

## FORT BUCHANAN

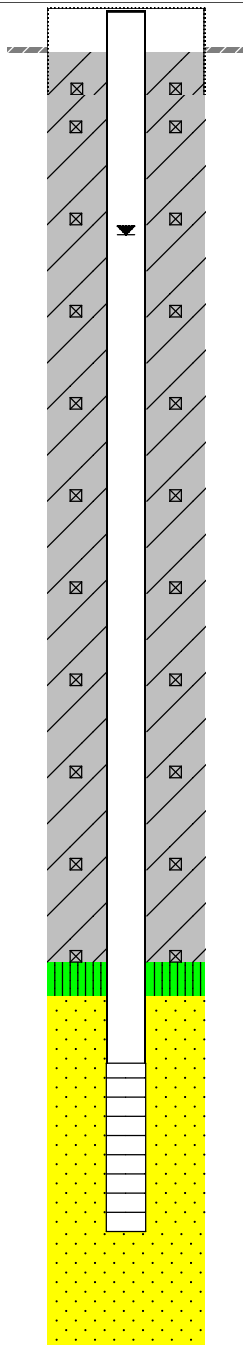
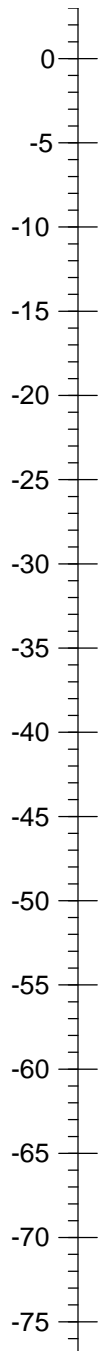
**Well ID:** OP-7      **Elevation (ft):** 14.24      Ref. Top of Inner PVC Riser      **Elevation Datum:** UTM NAD 83

**Geologist:** BILL HARVEY      **Driller:** FLOR RIVERA      **Start date:** 2/19/2009

**Survey Datum:** UTM NAD83      **Northing (ft):** 871527.8845      **Easting (ft):** 762653.3993      **End Date:** 2/20/2009

**Comment:** Buchanan

Depth (Ft.)	Well Diagram	Well Completion Description
-------------	--------------	-----------------------------



Locked, protective casing cover  
Protective casing extends from 2.5 feet ags to 2.5 feet bgs  
PVC cap  
2-inch ID PVC casing extends from 2 feet ags to 60 feet bgs  
CEMENT pad, 4'x4'  
Grouted from grade to 54 feet bgs

Gauged water level at 10.81 feet bgs

BENTONITE seal from 54 to 56 feet bgs  
Fine SAND No. 1 from 56 to 70 feet bgs

PVC slotted screen extends from 60 to 70 feet bgs